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THE HOME MEDICAL ADVISER





# THE HOME MEDICAL ADVISER

A POPULAR WORK ON  
THE TREATMENT OF DISEASE  
INCLUDING

FIRST AID IN INJURIES AND POISONING; THE MORE COMMON DISEASES IN MEDICINE, SURGERY AND THE VARIOUS SPECIALTIES—AS THE EYE, EAR, NOSE, AND THROAT, SKIN, AND DISORDERS OF WOMEN AND CHILDREN. ALSO DESCRIBING THE CARE AND FEEDING OF CHILDREN, HOUSEHOLD MEDICINES, SEXUAL HYGIENE, ETC.

BY

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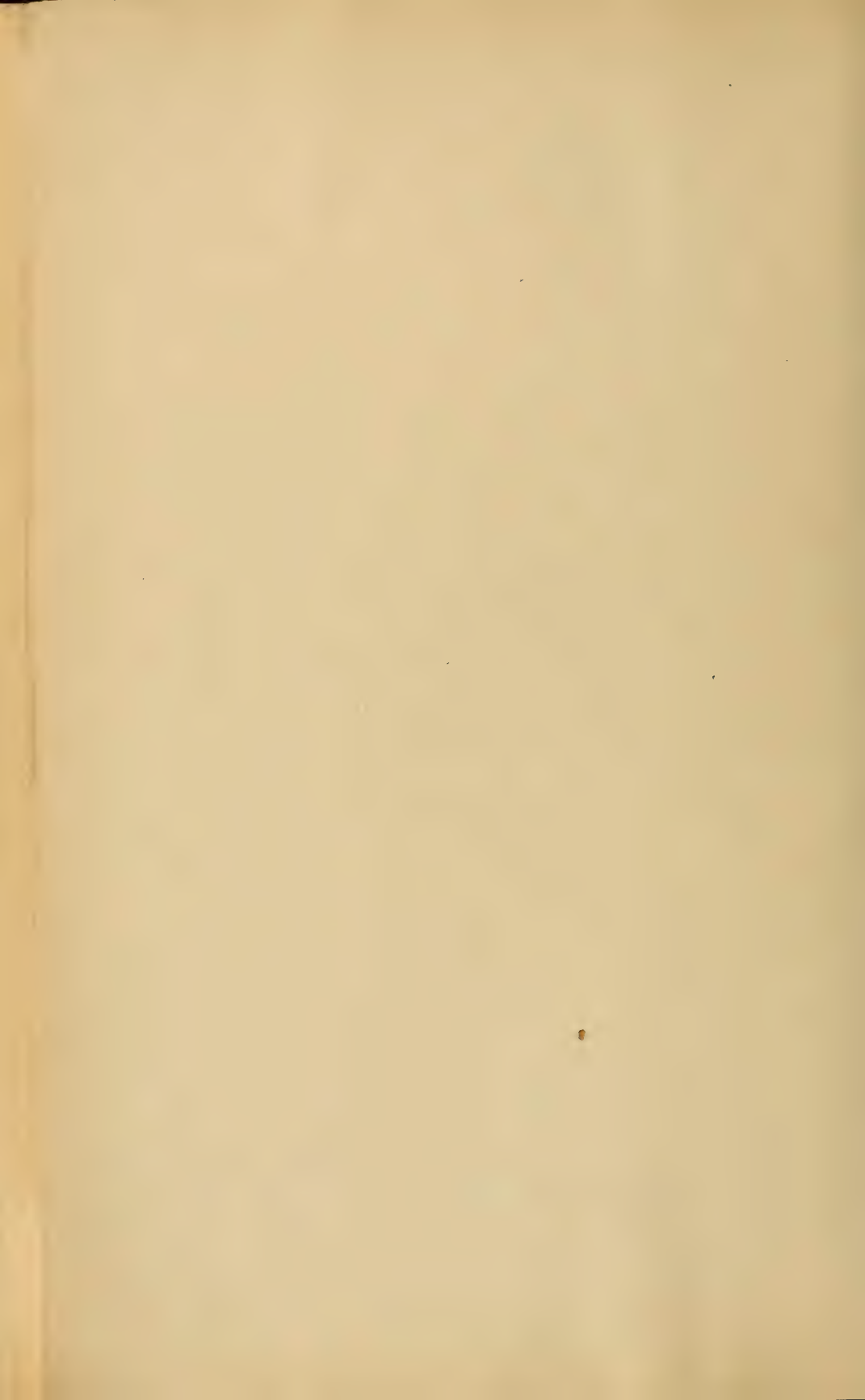
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no. 1.



TO  
M. O. W.  
THE INSPIRATION OF  
THE FIVE YEARS OF  
LABOR ON THIS BOOK



## PREFACE

In writing a popular medical treatise the author is thoroughly aware that he is entering a well-tilled field.

A similar work by him, however, published many years ago, met with such unusual success in the demand for over one hundred thousand copies that with riper experience and greater knowledge it may not be unreasonable to hope for a favorable reception of this new volume treating of the more recent progress in scientific medicine.

Three essentials have seemed paramount in the preparation of such a work: truth, simplicity and clarity.

An attempt has therefore been made to present the subject in a clear, terse, simple style, while strictly adhering to scientific accuracy and the canons of medical ethics.

There has been no desire to usurp the functions of the physician; on the contrary, the wish has been to aid his usefulness by giving the public a more intelligent understanding of scientific medicine, thus abolishing the mystery which has enshrouded the practitioner in the past.

Emphasis has been laid upon the prevention of disease—the chief aim of modern medicine.

Finally it may be affirmed that, in emergencies and at various times and places, the possession of a sound, practical reference book, or Medical Adviser, will prove not only of greatest service but even of life-saving value.

KENELM WINSLOW

*Seattle, Washington.*





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# THE HOME MEDICAL ADVISER

## PART I

### CHAPTER I

#### WOUNDS—SPRAINS—BRUISES

**Arrest of bleeding** in wounds of arteries and veins and in special parts of the body. **Arrest of bleeding** after extraction of teeth, in ruptured varicose veins, from lungs, stomach, bowels, and piles. **Immediate care** of fresh wounds, stitching wounds, care of lacerated, contused, punctured, and bullet wounds. **After-treatment** of wounds. **Lockjaw**. **Sprains** of the back, hip, knee, ankle, fingers. **Bruises**, abrasions, and cuts.

#### FIRST AID IN WOUNDS

A wound is a break or cut in any of the soft tissues of the body caused by external violence. In the treatment of wounds the matter of supreme importance is surgical cleanliness. This means that nothing shall touch a wound which is not free from germs.

Germs or bacteria are the cause of inflammation in a wound and also of local or general blood poisoning. A clean wound, if not too much torn or bruised, will heal at once without the formation of pus or matter—providing that the cut surfaces be brought closely together. Such wounds, like the cuts made by surgeons, will require but a single dressing. If a wound, on the other hand, becomes contaminated with germs, inflammation will set in, matter or pus will form, healing is slow, and all sorts of complications may ensue—even loss of limb or life. The three chief steps in the treatment of

wounds include: 1. Arrest of bleeding; 2. Cleansing, dressing, and covering the wound; 3. Securing rest of the injured part.

In ordinary wounds and cuts not requiring special means to stop the bleeding, and when stitching is not necessary or attempted, all that is essential is the swabbing of the wound with pure tincture of iodine, and application of sterile gauze and bandage. Apply the iodine on a pledget of absorbent cotton wound on the end of a toothpick or match. Instead of sterile gauze, clean cotton cloth boiled five minutes may be used.

#### ARREST OF BLEEDING

Bleeding is of three kinds: 1. From a large artery; 2. From a large vein; 3. General oozing from smaller vessels.

In general oozing the bleeding will stop naturally within a short time, in most cases, since the smaller cut blood vessels tend to contract and the blood in the ends of the cut vessels clots and plugs them.

The bleeding from ordinary cuts and small wounds is of this kind. If the bleeding is considerable and does not lessen soon, a perfectly clean piece of absorbent cotton, or clean handkerchief or towel, may be dipped in water as hot as the hand will bear and pressed wet on the wound and held there for some time by a tight bandage. Clean ice water may be used in place of hot water where the latter is not obtainable.

If the cut is on the arm or leg the limb should be held in the air resting on some object till the bleeding stops. The following remarks apply only to the treatment of severe bleeding. Where the bleeding is not severe, refer to page 8 for the further description of the care of wounds. Laymen are often frightened by the loss of small or moderate quantities of blood. When patients were bled it was not uncommon to remove from one to two pints of blood.

Blood flows away from the heart in the arteries and is then under most pressure. It is of a bright color and spurts in jets each time the heart contracts. To stop such bleeding, pressure must be made over the cut artery on the side toward the heart. Blood flows from the extremities to the heart in veins. The blood is dark and flows continuously from a cut vein, not in spurts. To stop bleeding from a vein, pressure must be made over the vein on the side away from the

heart, or over the wound itself, as much less pressure is required to arrest the flow of blood.

**To Stop Bleeding When Bright Red Blood is Coming in Spurts from a Large Artery.**—(a) Place the patient on his back and press with both thumbs into the soft parts just above the wound—that is between it and the heart.

(b) While pressure is thus made above the wound, if of arm or leg, an assistant may tie a piece of elastic tubing or elastic suspenders very tightly about the limb between the wound and the heart. Or a piece of rope or strap may be wound tightly about the limb over a towel or shirt to protect the soft parts. Or a folded towel or handkerchief may be tied loosely about the limb and a stick used to twist up the slack so as to make a very tight bandage above the wound about the limb. A rounded stone or cork placed under the noose and directly over the bleeding vessel will still further aid. Then the pressure over the bleeding vessel with the thumbs may be removed unless the bleeding has not been arrested. The bleeding arm or leg should be also held up, resting on some sort of support, in order to keep the blood out of the limb.

In case of a bleeding artery of any considerable size, the amount of pressure required to stop the bleeding will arrest the circulation in the limb and cause much pain and damage if it be continued for more than an hour. Therefore a surgeon should be summoned at the earliest moment to tie the vessel. In the meantime the wound should be painted with tincture of iodine, by means of a piece of absorbent cotton wound about the end of a moistened stick, and covered with a pad of sterile gauze or cotton and bandage, and the whole limb covered warmly and kept elevated till the surgeon comes. Any band tied tightly about a limb in order to stop bleeding from a large vessel is called a tourniquet. Those made for this especial purpose consist of a rubber band with hooks at the ends to fasten them together (Esmarch's), or the ordinary field tourniquet used for military purposes is composed of a band of webbing to which a pad is attached. After adjusting the pad over the bleeding vessel and tightening the band, the pad is more firmly pressed upon the vessel by means of an adjustable screw.

**To Stop Bleeding from a Vein. Steady Flow of Dark Blood.**

—Make firm pressure with a pad of sterile absorbent cotton or gauze, or clean handkerchief wet with alcohol, placed directly over the wound. The pressure may be maintained by a tightly applied bandage over the pad where this can be used. The flow of blood in this case is from the extremities toward the heart so that a piece of rubber tube, elastic, suspenders, or handkerchief, may be tied about a limb on the side of the wound which is farthest from the heart to stop the bleeding.

This is usually unnecessary, as pressure over the wound is commonly sufficient to arrest bleeding from a vein. Neither is it ordinarily necessary to tie even a large vein to stop bleeding, as in the case of a cut artery—providing the wound is tightly bandaged after it is dressed.

After the first half hour the tourniquet (if one is used) about the limb may be taken off, and if the bandage is so tight as to interfere with the circulation it may be reapplied more loosely.

**TO STOP ARTERIAL BLEEDING FROM SPECIAL PARTS OF THE BODY**

**Bleeding from the Scalp.**—Cover the wound with a wad of sterile absorbent cotton or gauze, or a clean handkerchief or towel folded into a pad and saturated with alcohol, and press down the pad firmly over the wound. If this does not soon stop the bleeding a piece of rubber tubing may be tied tightly about the head below the wound. A large cord or small rope may be used in place of the rubber tube if tied over a folded towel to protect the skin. Pressure made by the thumbs of both hands just above and in front of each ear will compress the temporal arteries and tend to lessen the bleeding.

**Bleeding from the Face and Neck.**—*Lip.*—Bleeding from the cut lip may be stopped by holding the wounded part firmly between the thumb and forefinger. The hands should be thoroughly washed first.

*Carotid Artery.*—The great vessel of the neck (carotid artery) may have been cut on the left side in attempted suicide, and by accidental means on either side. To stop bleeding from this vessel one should press with the thumb on the vessel below the wound in the



neck. The place to make this pressure is about two inches below and one inch in front of the ear, where the beating can be plainly felt. Lower down in the neck the vessel is situated a little farther forward. The vessel should be pressed by the thumb, partly encircling the side of the neck, against the bones behind it. Of course this is but a temporary measure and the vessel must be tied by a skilled surgeon in order to permanently stop the bleeding from so large a vessel.

*External Jugular.*—A large vein (external jugular) runs down the neck from back of the jaw to the middle of the collar bone and is more apt to be cut because it is nearer the skin. The blood would then be dark and in a continuous flow and not in jets as from the carotid artery.

To stop such bleeding pressure should be made over the bleeding vessel just above the wound. In no case should a tight bandage be tied about the neck, as it would choke the patient.

**Bleeding from the Shoulder and Armpit.**—This region is supplied by a large vessel (subclavian artery) situated behind the collar bone. As a temporary measure bleeding may be stopped, in injury, about the shoulder or armpit, by deep pressure exerted by the thumb behind the middle of the collar bone which forces the artery upon the first rib. Also bleeding in the armpit may be controlled by folding a clean towel into a pad, forcing it up into the armpit, and then binding the arm firmly to the side.

**Bleeding from the Arm, Forearm, and Hand.**—There is one main artery (brachial) running down the inside of the arm, from the middle of the armpit to the middle of the bend of the elbow; at the bend of the elbow it divides into two vessels, one of which (ulnar) runs down the little finger side, and the other (radial) runs down the thumb side of the forearm and is commonly felt at the wrist in taking the pulse.

To stop bleeding from a wound in the arm or forearm, make a tourniquet and fasten it about the upper part of the arm. In a cut of the palm of the hand one should make a pad of two clean handkerchiefs or other cloth, and bandage very tightly over this and continue the bandage firmly up above the elbow. The hand should be then

kept elevated by tying it up to the head of a bed or other support.

**Bleeding from the Thigh, Leg, Foot, and Forearm.**—*Thigh—Knee—Forearm.*—Here the application of a tourniquet to the upper part of the thigh will stop bleeding from an artery below this point, but in bleeding from the back (or bend) of the knee a folded towel may be placed in the bend of the knee and the knee bent as far as possible so that the heel will touch the thigh. Then the leg is held in this position by tying a bandage about the middle of the thigh and leg. The same method of controlling bleeding in the forearm may be applied by placing a pad in the bend of the elbow and then bringing the forearm as close to the arm as possible and holding it in this position by a bandage.

*Foot.*—Bleeding from the foot may be stopped by placing a tourniquet tightly about the leg just below the knee. Also pressure with the thumb across the instep above the wound will control bleeding from a cut on the upper part of the foot, while pressure made with the thumb in the hollow just behind the inner prominence of the ankle bone (internal malleolus) will control bleeding from the sole of the foot.

When bleeding can be stopped by simple pressure on a single vessel it is better than using a tourniquet around the whole limb, as hand pressure does less damage. But a tourniquet is desirable where the patient must be transported and where considerable time must elapse before skilled surgical assistance can be obtained.

**Bleeding after the Extraction of a Tooth.**—This occasionally is persistent, and in order to stop the bleeding a plug of absorbent cotton or sterilized gauze saturated in a strong solution of alum—or better adrenalin solution (1 to 1,000)—should be forced into the cavity and held in place by keeping the jaws tightly together with a bandage tied over the head and under the chin. The plug may be soaked in strong tea, when the medicines advised cannot be readily obtained. Spitting and swallowing tend to favor bleeding and must be stopped. The head may be held to one side to let the saliva and blood flow out of the corner of the mouth.

**Bleeding from Varicose Veins in the Legs.**—Enlarged or varicose veins are common in the legs, especially on the inside and back

of the calves, where they stand out as bluish cords and knots. Considerable bleeding may result from the breaking of one of these veins. It may be readily stopped by causing the patient to lie down with the feet elevated on some object, and by placing a clean handkerchief or towel folded in a compress, over the wound, and holding this down firmly by means of a bandage applied from the ankle to above the bleeding point. The patient should remain quiet on his back for a day or more after the accident.

### INTERNAL BLEEDING

**Bleeding from the Lungs (Hemoptysis).**—This is almost always caused by tuberculosis of the lungs. It is rather a favorable symptom in consumption unless the bleeding is copious.

In 16 per cent. of consumptive patients hemorrhage is the only symptom, and no future trouble may develop. The blood is bright red and frothy, from a teaspoonful to a large amount, and often accompanied by coughing. The chief aid that can be given a patient is to quiet him in body and mind. Make him lie down with the head raised; do not allow him to talk; and place a folded cloth wrung out in cold water over the front of his chest. Deep breathing lessens bleeding; and three drops of spirit of turpentine given on sugar and repeated hourly for four doses is a good remedy.

Bandaging the limbs, from the feet to the thigh, is useful in severe bleeding to keep the blood in the limbs and lessen the return flow of blood in the veins. No alcohol in any form should be given, but a dose of sixty grains of sodium bromid dissolved in a whole glass of water is very useful in diminishing fear, excitement, and cough.

The patient should remain quiet in bed for many days after a severe hemorrhage, on a diet of milk, toast, cereals, and soft eggs.

**Vomiting of Blood.**—The blood is bright red when the bleeding is copious; otherwise it is black or rust-colored. The patient should be kept perfectly quiet and flat on the back with the head slightly raised. It is better to give nothing whatever by the mouth; alcoholic drinks are especially to be avoided. Most persons recover from the vomiting of blood without special treatment other than quiet,



rest, and abstention from food and drink for three days. One quart of water as hot as the hand will bear should be injected slowly into the bowel and repeated three times a day; the heat tends to stop the bleeding from the stomach. When a physician cannot be reached to give morphin under the skin, one suppository containing one-half grain of the extract of opium should be placed in the bowel as soon as possible after the bleeding. This is the dose for an adult and opium is the most useful drug in relieving excitement, and so quieting the patient.<sup>1</sup> Small pieces of ice may be placed in the mouth to relieve thirst. After three days milk may be given every two hours.

Severe bleeding from the stomach is commonly caused by ulcer of the stomach or bowels, or cancer of the stomach—when there has been a previous history of chronic indigestion. If there has been no such history then the bleeding arises from diseases of other organs, as the liver and heart. When blood has been swallowed in large quantities, after injury to the head and in unconsciousness, it is likely to be vomited—but in these circumstances the vomiting of blood does not indicate diseases of the stomach.

**Bleeding from the Bowels.**—When the bleeding is severe the patient may suddenly fall down in a faint, and some hours after pass bright red or tarry-looking blood from the bowels. In case the patient has a previous history of indigestion it is probable that the bleeding is caused by duodenal ulcer, and such an attack is sometimes the first symptom of this disease. Bleeding from piles is bright red, and the amount at one time is not so great as to endanger the patient; it occurs usually after or with a bowel movement. The treatment of severe hemorrhage from the bowels is the same as that for bleeding from the stomach. Hemorrhage from the bowels is one of the complications in typhoid fever.

#### CLEANSING, DRESSING, AND COVERING THE WOUND

**The Immediate Care of Fresh Wounds.**—Severe hemorrhage is arrested by the methods detailed. In ordinary cuts and wounds, in which the bleeding is slight or has been arrested, the chief object should be to free the wound from germs and keep them out. Prac-

<sup>1</sup> Opium is a powerful drug, sold only on a doctor's prescription.



tically all wounds are contaminated with germs unless made with the surgeon's knife, when the skin and knife are first rendered germ-free. Slight cuts will heal without any special care in many cases because the tissues destroy a certain number of germs. It is safer to act as if all wounds were infected with germs.

There are two ways to rid wounds of germs: one is by prolonged washing with boiled water or weak antiseptic solutions, the other is by the use of iodine without washing. Both methods are in use by leading surgeons, but the latter is more suitable for the layman. The iodine method is that in which reliance is placed on the action of tincture of iodine in penetrating the tissues and killing germs. No water should be employed at all in washing the skin or wound when iodine is used, because a surface wet with water prevents the penetrating action of the iodine. When the skin is very dirty or greasy it is well to first wipe the skin about the wound with benzine, ether, or alcohol, and wait for its evaporation before applying the iodine. The wound should be protected meanwhile by holding a dry pad of sterile gauze over the wound while wiping the skin. Instead of pure tincture of iodine a solution prepared by diluting the tincture with an equal amount of alcohol should be used on the skin and wound, except in the case of small wounds.

In the use of iodine, after any severe bleeding is checked and all foreign bodies picked out (as clothing, hair, splinters, glass, etc.) with a pair of forceps or hatpin which has been previously boiled, tincture of iodine is swabbed thoroughly into all parts of the wound by means of a piece of absorbent cotton which has been wound about the end of a moistened match or small stick of wood. The surrounding skin has also been swabbed over, as described. Then the wound may be either covered at once with sterile gauze or, if necessary, stitches may be used to close the wound and the tincture of iodine should again be swabbed over the stitches after they are tied. Some considerable smarting may be caused for a short time by the iodine. This method is wonderfully simple and effective and has largely superseded the older cleansing method in many hospitals. It is particularly applicable for a first aid dressing in fresh wounds for the layman, because no appliances are needed. Tincture of iodine

should be kept on hand wherever surgical accidents are liable to occur. Two parts of alcohol and one part of water mixed together makes one of the best antiseptics for application to ordinary cuts, although not as powerful as tincture of iodine.

When the iodine method is not used the attendant should boil some pieces of absorbent cotton, as large as an egg, together with a hand scrub brush, in an enamel hand basin of water for ten minutes. If the wound is large enough to require closing by stitches and one is to attempt this then black or white silk (cotton may be used) thread, needles, scissors, a folded towel and forceps should be boiled for ten minutes in the same basin. In the meantime the attendant should wash his hands for five minutes with soap and water and then with seventy per cent. alcohol, without drying his hands on a towel. Another basin of clean, warm water containing one large-sized corrosive sublimate tablet, or three teaspoonfuls of compound cresol solution to the quart, should be prepared. If neither absorbent cotton nor antiseptics are at hand, one may use pieces of cotton cloth boiled in water which is allowed to cool sufficiently. In case the wound contains much dirt it is better to mix the antiseptic solution in a pitcher so that it may be poured with some force into the wound, thus acting more efficiently as a cleansing agent. When stitches are to be taken the needles should be threaded before boiling and, to prevent snarling of the thread in boiling, the threaded needle should be run in and out through a strip of cotton cloth and the whole boiled. After boiling, the materials should be taken from the fire and the water poured off. Then the absorbent cotton should be placed in the antiseptic solution with the clean fingers or, better, boiled forceps.

Any hair should be shaved off (this is not necessary when iodine is used) for several inches about the wound, and the skin about the wound washed with soap and water—clean water—and then alcohol (70 per cent.), while the wound itself is kept covered with a piece of sterile gauze or boiled absorbent cotton. All foreign matter in the wound, as splinters of wood, clothing, loose bits of skin, glass, etc., should be picked out with forceps or a boiled hatpin. Then the wound must be most thoroughly bathed with the antiseptic solution and cotton sponges. If there is much bleeding the antiseptic solution

must be as hot as the patient will bear and all clots should be washed out. For this purpose, and in dirty wounds, the solution may be poured from a pitcher held a foot or so above the wound; in dirty wounds this washing should be continued from ten to twenty minutes. The wound should be covered with sterile gauze and bandage. If gauze is not available cotton cloth, which has been boiled five minutes, is satisfactory. That part of the gauze or cloth which will touch the wound must not be touched by the fingers. If, however, surgical assistance cannot be obtained for twenty-four hours and the wound is large an attempt should be made to close the wound by stitches.

**Stitching the Wound.**—After the attendant has cleaned the wound (or painted it with iodine) and again washed his hands he should place the boiled towel about the wound so that the thread may lie on the towel and not become contaminated by touching the skin. Ordinary strong, straight sewing needles may be used when surgical needles are not obtainable. The needle is grasped between the thumb and forefinger or, better, by a surgical forceps. It is thrust in the skin about one-eighth of an inch from one cut edge of the wound and should not go deeper than the skin, and should leave the skin about the same distance from the cut edge on the other side of the wound.

The stitches are placed about one-half inch apart, and are drawn together and tied in a square knot, cutting the ends about one-half inch from the knot. The stitches should be tied just tight enough to bring the edges of the wound together. If tied more tightly the thread will cut into the skin when the usual swelling occurs about the wound. During the stitching the thread, scissors, and forceps, should be laid only on the boiled towel. Large gaping wounds are more properly closed by stitches but it is wise to stitch the wound only in part, leaving an inch or so open for drainage. Small, deep, punctured wounds are not closed at all but should be kept sedulously open, after swabbing to the bottom with iodine, by pushing in a strip of boiled cotton cloth or gauze, to secure drainage. This may be removed in forty-eight hours.

Sterilized catgut sutures may be used for closing wounds which come together readily. If there is much tension on catgut the stitches will not hold. Catgut has the advantage of being absorbed.



**Adhesive Plaster.**—Adhesive plaster may be used to close fresh, clean wounds and the layman can perhaps more easily employ it than stitches. Strips of plaster one-third of an inch wide, and long enough to obtain a good hold on the skin, should be laid at intervals of half an inch across the wound. The ends are applied to one side the wound and, while the edges of the wound are pinched together, the free ends of the strips are carried across the wound and fastened to the skin beyond. The strips of plaster should never wholly encircle a limb or the circulation would be impeded.

**Further Care of Wound.**—When a clean wound is covered with sterile gauze and bandage, after stitching or closing with strips of adhesive plaster, the rule is not to disturb the dressings for a week unless the patient has fever, suffers pain, or the dressings become soaked through with blood or secretion. At the end of this time the stitches are cut with scissors and taken out by forceps or the fingers, after the attendant has thoroughly washed his hands in water and alcohol and boiled the instruments. Whenever the dressing becomes soaked through it should be replaced by a fresh dressing, although the layer of gauze next the wound may be left in place for three days or a week if there is no fever. If the wound is already infected at the time it is first seen, or becomes so, the stitches should be removed at once. Infection is recognized by the occurrence of pain, swelling, heat and redness about the wound, by fever (in large wounds), and the appearance of matter or pus.

When there is much inflammation it is a good plan to apply a moist dressing until the inflammation has subsided. This is made by soaking sterile gauze in a warm, saturated solution of boric acid (as much as the water will dissolve), wringing out the water slightly with clean hands—being careful not to touch that part of the gauze which will come in contact with the wound. The wound is covered with this dressing an inch thick and then with a piece of oil silk or rubber cloth, which will keep the dressing moist for twenty-four hours, when the whole is covered with a bandage. Instead of boric acid a solution of corrosive sublimate or compound solution of cresol, in half the strength advised above for cleaning wounds, may be employed.



## SPECIAL WOUNDS

**Incised Wounds.**—An incised wound is one made with a sharp, cutting instrument, as a knife, glass, razor, sword, etc. It is apt to be clean and to heal readily. In wounds of certain parts, as the wrist, the nerves and tendons are so near the surface that they are likely to be severed. Simply stitching the wound together will not cause union of cut nerves and tendons. Only a surgeon can properly repair such tissues, and one sees not infrequently a permanently disabled hand caused by the closure of a wound where injured nerves and tendons were not sutured—even by doctors.

**Lacerated and Contused Wounds.**—These are caused by some blunt instrument and are apt to be contaminated with dirt, with much tearing and bruising of the tissues. They present a ragged appearance, do not bleed much, but will not heal readily. These are the wounds which may be swabbed with iodin and not closed unless large, when they may be stitched in part. As they usually do not heal readily but form pus and become inflamed the use of the wet, antiseptic dressing of boric acid (see above) should be used from the beginning in extensive, lacerated, and contused wounds. In lacerated, contused, or punctured wounds antitoxin is often advisable to prevent lockjaw.

**Punctured Wounds.**—Punctures are made with small instruments, as a nail, scissors, splinter of wood, knife, the tooth of a dog or cat. All such are peculiarly bad because they are generally infected by germs and the wound closes behind the withdrawing instrument and leaves the germs sealed in the wound. In punctures by very small sharp clean instruments, as needles, treatment may not be necessary, but in all other punctured wounds the skin about the wound should be cleaned by wiping with alcohol or ether, and the wound should be swabbed to the bottom with tincture of iodin on a piece of cotton wound on a small stick, as a toothpick. By moistening the wood in water, before twisting a wisp of absorbent cotton on its end, the cotton will adhere strongly to the wood and its escape in the wound will be prevented. It goes without saying that any foreign body in the wound should be withdrawn with forceps.

Punctured wounds too small to swab out should be opened; but

this cannot be done properly by a layman. Then the moist dressing of boric acid and gauze, described above, should be applied. It is well to stuff a piece of gauze or strands of boiled string in punctured wounds at the first dressing to aid drainage. This may be done with a piece of stiff wire (as a hairpin), which is smooth at the end, and which has been boiled five minutes.

After dressing the wound the part should be kept at rest by a sling or splint.

**Scalp Wounds.**—These bleed a good deal but the bleeding may be stopped by applying water as hot as can be borne, and then a wad of sterile gauze or boiled cotton should be placed in the wound and bandaged down tightly into it for a while. When the bleeding is stopped, or when there is not excessive bleeding, a wad of sterile gauze or cotton should be pressed down so as to cover the wound and arrest bleeding while the hair is cut for a considerable area about the wound. The wound and surrounding skin are then swabbed with the tincture of iodine and if possible the wound should be closed with stitches, as described above. The stitches will stop the bleeding more effectively than will anything else; they should be tied loosely, and should be introduced as much as half an inch apart to allow drainage of discharge from the wound. Apply a dry dressing of gauze, and bandage.

**Bullet Wounds.**—These are produced by the shotgun, revolver, or rifle. In the case of the shotgun at long range the single shot will not generally do much harm unless it enters the eye. At close range a charge of shot, especially buckshot, acts as one missile and carries away a mass of tissue, or fingers, or toes, and makes a dreadful wound which is commonly fatal when any large vessel or cavity of the body is entered. In the treatment of injury by a single shot the wound should be swabbed with tincture of iodine and covered with sterile gauze, or cotton which has been boiled for five minutes, and bandaged. In case of wounds from a charge of shot at close range, treatment consists in stopping the bleeding by the methods described, trimming away ragged, loose bits of tissue, painting the wound and surrounding skin with tincture of iodine, or cleansing it with solutions, as has been set forth, to remove germs, and packing in loosely some

sterile gauze or boiled cotton cloth to aid drainage. The dressing should be of sterile gauze. Lockjaw is to be feared following such wounds.

**Blank Cartridge and Toy Pistol Wounds.**—These occur at close range and consist of burns and lacerations, with often a fragment of wad or clothing buried in the wound. Bits of the envelope of the fulminate explosive in toy pistols are often driven far into the tissues. Lockjaw is especially to be dreaded in these wounds. The skin should be cleansed by wiping with alcohol or benzin (avoid fire) and foreign bodies should be picked from the wound, which must be enlarged if necessary, and then wound and skin should be swabbed with tincture of iodine and a few strands of string, which has been boiled five minutes, or a small strip of gauze, should be pushed into the bottom of the wound to secure drainage. The moist dressing of gauze and boric acid solution should be applied, and following this, a bandage.

**Revolver Bullet Wounds.**—The bullet lodges in the tissues or perforates and escapes. The wound of exit is larger and the edges are turned out, while the wound of entrance is smaller and may be blackened or tattooed by powder grains, in case of shooting at close range. There is usually not much bleeding. The future course of the wound depends largely upon the first aid dressing. The wounds should simply be swabbed with tincture of iodine, including an area two inches wide or so about the wound, and covered with a pad of dry sterile gauze and bandage.

The wound should then be kept at rest by a splint or sling and by the patient remaining in bed. Probing for bullets is generally undesirable because of the danger of infecting wounds with germs, and it never should be undertaken by the layman. X-ray examination is the method by which the site of lodged bullets is determined at present. A bullet is not freed from germs by the heat generated in the weapon—although it is partly so freed, and also to a considerable extent by the scraping against the inside of the barrel of the weapon. There is danger of parts of the clothing (containing germs) being carried into the wound by the bullet. Bones more often deflect pistol bullets, while rifle bullets perforate or shatter them. A revolver



bullet may be so deflected by bone that it passes completely around the chest on a rib, or about the skull under the skin.

A bullet that has become misshapen by striking a bone may produce a large and ragged hole where it emerges. There may be no pain, or only a stinging numbness may be felt by the persons shot. The dangers are bleeding, shock, and poisoning of the wound and body as a whole by germs, carried in by the bullet itself or by clothing. If a portion of the clothing has been carried into the wound there will surely be an infection of the wound. The bleeding is usually not dangerous because large vessels are often not injured or are pushed aside. If severe hemorrhage occurs it must be treated as recommended above.

Shock may be so severe that the patient has profound depression and weakness, is pale, with cold extremities and skin, and weak, rapid pulse. The best treatment for the layman to pursue is to make the patient lie down and keep quiet. The wound should be swabbed with tincture of iodine and, when dry, a piece of sterile gauze should be applied and then a bandage. If there is much shock the patient should be given three tablespoonfuls each of whisky and water, he should be covered warmly, and should have hot water bags placed about him in bed. Healing of the wound rarely occurs at once, but more or less "matter" or pus forms owing to the destruction of tissue along the course of the bullet. In case the skull, chest, or abdomen are entered operation may be immediately required. It goes without saying that a surgeon should be summoned at the earliest opportunity in any case.

**Rifle Bullet Wounds.**—In the army and some sporting rifles a lead bullet with a hard jacket of copper and tin is used. These tend to perforate the body and escape, leaving a comparatively small track, and wounds may heal immediately if properly cared for. Sporting rifle bullets with a soft nose spread in the body and tear the tissues so extensively that death usually follows, if the trunk or head are struck, and amputation becomes necessary if the limbs are shot. The hard, small, jacketed bullets of modern warfare do not generally shatter bone at distances over five hundred yards, but cut a clean hole through it. They do not make a large wound of exit



because they are not much deformed in their passage through the body. Bits of clothing are not apt to be carried into the wound.

At distances under five hundred yards the modern military rifle bullet shatters bone and causes tissue to explode, or burst asunder, so that the whole brain or abdominal organs may be practically destroyed. Tissues are not pushed aside as by a revolver bullet, but large vessels are cut as with a knife, and fatal bleeding may rapidly ensue. At distances of over one thousand five hundred yards the modern military rifle is a humane weapon. In some cases there have been practically no bad effects from perforating wounds of the lung, brain, belly, and joints. The bullet is not free from germs as some (not removed by the cleaning in the barrel and burning of the powder) adhere to the point. The tissues are but slightly lacerated, clothing is not carried into the wound, and the germs scattered along the track of the bullet are so few that the tissues can overcome and destroy them.

In the Russo-Japanese war only thirty per cent. of the wounds among the Russians are said to have suppurated, or formed "matter." In the present great European War 95 per cent of the wounds are infected in soldiers living in the trenches—owing to their filthy clothes and skin. The symptoms and treatment of rifle bullet wounds are much the same as in the case of revolver bullets. Severe shock and bleeding are more common; they should be treated as already recommended. Unless these are very severe, or bone or vital parts greatly injured, it may happen that the first-aid dressing will be the only one necessary.

Clothing should be cut away about the wound; the skin and wound should be painted with tincture of iodin; and when this is dry a sterile gauze pad of considerable thickness and a bandage should be applied, and the patient and wounded part kept at rest. In lieu of iodin the wound may be bathed with alcohol, or water which has been boiled. Where neither are obtainable the sterile pad should immediately be applied to the wound.

The first-aid packet carried by U. S. A. soldiers contains two bandages, two compresses, and two safety pins in waxed paper in a metal case. The compresses are of corrosive sublimate gauze, and

one is sewed to the middle of each bandage which is so folded that the compress may be opened without touching with the fingers the surface which will come in contact with the wound.

It will be seen that the iodine treatment of wounds is a great improvement in the matter of simplicity over the older method of cleansing with boiled water or antiseptics, as it avoids the necessity of sterilizing the hands, of boiling sponges, instruments, and water, and of fifteen minutes or more spent in washing. All that is necessary is a bottle of iodine, a stick, and some absorbent cotton to wind about it for applying the iodine; the results appear to be just as good with either method. Most surgeons now prepare the skin for operations by simply swabbing the skin with benzine, to remove grease, and then with tincture of iodine (diluted with an equal part of alcohol). The older procedure consisted in scrubbing the skin with soap and water for 10 minutes and then applying in turn various antiseptics.

#### AFTER-TREATMENT OF WOUNDS

All wounds should be kept at rest after they are dressed; this is accomplished in the case of the lower limbs by keeping the patient in bed with the leg raised on a pillow. The same kind of treatment applies in severe injuries of the hands.

In less serious cases a sling may be employed, and the patient may walk about. When the injury is near a joint, as of the fingers, knee, wrist, or elbow, a splint made of a thin board from a box or of tin (and covered with cotton wadding and bandage) should be applied by means of surgeon's adhesive plaster and bandage, after the wound has been dressed. In injuries of the hand the splint should be applied to the palm side and should reach from the finger tips to within two inches of the bend of the elbow. In injuries about the knee the splint should be of board four to five inches wide and three-eighths to one-half inch thick, and applied along the back of the leg from two inches above the ankle to half way up the back of the thigh.

It is impossible in a work of this kind to describe the details of the after-treatment of wounds, as this can only be properly carried out by one with surgical experience, owing to the varying conditions

which may arise. In general it may be stated that the same cleanliness and care should be followed during the whole course of healing as has been described for the first dressing. Iodin is not used, however, after the first dressing. If fresh incised wounds are treated, as has been recommended, it is to be expected that they may heal by primary union, that is, heal at once without any other dressing. In such a case the dressing will not be removed until a week or ten days has elapsed, unless there is much pain about the wound with redness, heat, swelling, and formation of "matter." The stitches are not disturbed until ten days when they are cut with a scissors and pulled out with dressing forceps, the instruments having first been boiled for five minutes and the hands of the attendant washed. The instruments are kept in the basin in which they are boiled, and the hot water is poured off.

Wounds require daily dressing when they do not heal at once but become more or less inflamed and form pus or "matter." If stitches have been used they should be taken out as soon as "matter" forms, or the parts about the wound become much reddened, swollen, and painful. Then a dressing of gauze wet in boiled water (containing as much boric acid as it will dissolve, or compound lysol solution, or corrosive sublimate) should be applied and covered with oiled silk or rubber cloth and changed once daily. If there is much pus the depths of the wound should be syringed with boiled water or one of the solutions just mentioned.

This treatment should be pursued until the pain and inflammation subside and then the treatment should be changed to the daily cleansing of the wound, as just described, followed by the application of just enough Peruvian balsam to cover the wounded surface, dry gauze, and bandage. This latter treatment is also suitable from the beginning in wounds which form pus but are not painful or much inflamed. Some sterile or borated vaselin in tubes is very useful if sufficient is squeezed out of the tube each day to cover the wound—after application of the Peruvian balsam, the vaselin makes the wound much more comfortable and prevents the gauze from sticking to it. When there is little discharge or pus, the skin about the wound may merely be wiped off with alcohol on a piece of absorbent



cotton; some hydrogen dioxid is poured on the wound from the bottle, and the froth gently wiped from the wound by a piece of sterile gauze. The wound is then covered with Peruvian balsam, vaselin, gauze, and bandage. This is the simplest and best method of treating ordinary, moderate-sized wounds, and it avoids the necessity of making any solutions and boiling a syringe or instruments.

It is a surgical maxim never to be neglected that wounds should not be allowed to close at the top before healing is completed at the bottom. As wounds tend to close at the surface when they heal slowly and discharge pus, it is necessary at times to enlarge the external opening by cutting or stretching with the blades of a pair of scissors (first boiled five minutes), or—and this is much more rational and comfortable for the patient—by daily packing the outlet of the wound with gauze, to keep it open. The attendant should always wash his hands before dressing a wound and not touch the wound itself or the dressings with his fingers.

If the wound is to be washed or syringed some pieces of absorbent cotton, a glass syringe, forceps and scissors should be boiled in a basin five minutes. Then the boiling water is poured off and, when cool, the sponges are held with the forceps while washing the wound with an antiseptic solution, which has been placed in another basin. The same is syringed on the wound. Then the gauze is cut with the boiled scissors and placed on the wound with the boiled forceps. When instruments are not available that part of the dressing which touches the wound should not be touched with the fingers.

## LOCKJAW

(*Tetanus*)

This is a very terrible and often fatal disease exhibiting at first stiffness of the neck and muscles of the jaw, so that swallowing becomes difficult or impossible, to be followed later by rigidity of the muscles of the trunk, and convulsions.

The cause of the disease is a germ which lives in dirt, especially stable dirt and street dirt, and in garden soil and dust from walls,



walks and cellars. It is thought that tetanus germs live in the intestines of animals and hence the danger from manure and stable dust. The germ always enters the body through a wound or abrasion of the skin or mucous membranes, although either may be so small as to be imperceptible. Lacerated and punctured wounds of the hands and feet, especially if made with a stable fork or splinter from a stable floor, or by a toy pistol or firecracker used in Fourth-of-July celebration, are most liable to cause lockjaw. The germs of lockjaw grow best in the absence of air so that punctured wounds, and those filled with pus, into which air cannot enter freely, are most favorable to the development of the disease.

Lockjaw is more common in certain regions, as in Northern New York, Long Island, Virginia, Pennsylvania, Georgia and Louisiana.

**Prevention.**—Prevention of the disease when due to wounds is of the greatest importance because it can be successfully carried out. Prevention is obtained first by properly opening and sterilizing wounds with iodine, and keeping them open with a strand of gauze for drainage, as described under punctured wounds. Then the injection of tetanus antitoxin is advised in such injuries as Fourth-of-July wounds or punctured or lacerated wounds of other parts, especially of the hands and feet, into which dirt has entered. This is particularly desirable in localities in which lockjaw is prevalent. The use of antitoxin at the time of the injury, or within a day or so afterward, is an almost certain preventive of tetanus and is attended with no danger to the patient. Thus in St. Louis in 1903, there were fifty-six cases of Fourth-of-July wounds, followed by sixteen cases of lockjaw, in none of which was tetanus antitoxin used as a preventive. In the following three years there were two hundred and ninety-one cases of Fourth-of-July injuries treated with antitoxin and not a single case of lockjaw followed. The wounds producing lockjaw usually have occurred in boys who have exploded blank cartridges in the palm of the hand. In this way the germs of tetanus in the dirt on the skin are forced into the wound, together with a portion of the wad from the shell.

Since lockjaw has been so frequent after these accidents it is impossible to exert too much care in treatment. The wound should

be opened to the very bottom, under ether and by a surgeon, and not only every particle of foreign matter removed but all the surrounding tissue should be thoroughly sterilized. Then a dose of antitoxin should be injected under the skin. When, in spite of the use of antitoxin, tetanus has occurred it has been of a mild character. Proper restriction of the sale of explosives will put an end to this awful result of a barbarous mode of exhibiting patriotism. The dangers of tetanus are among the chief reasons for the "safe and sane Fourth."

### SPRAINS

A sprain is an injury caused by a sudden wrench or twist of a joint, producing a momentary displacement of the ends of the bones to such a degree that they are forced against the capsule or membrane surrounding the joint and the ligaments which bind the bones of the joint together, tearing one or both to a greater or less extent.

The joints more often sprained are the ankle, the wrist, the fingers, the elbow and knee; less often, the shoulder, the sacro-iliac joint, and the hip. The young and adults with flabby muscles and relaxed ligaments are more frequently the victims. The damage to the parts holding the joints in place may be of any degree from the tearing of a few fibers of the membrane (capsule) enwrapping the joint to its complete rupture, together with that of the ligaments, muscles, tendons, blood vessels, and nerves surrounding the joint, so that the bones are no longer in place, the joint losing its natural shape and appearance; we have then a condition known as dislocation. In a sprain the twist of the joint produces only a momentary displacement of the bones forming the joint, sufficient to damage the soft parts around it, but not sufficient to cause lasting displacement of the bones or dislocation.

It will be seen that whether a sprain or dislocation results depends upon the amount of injury sustained. Since it often happens that the bones entering into the joint are broken (sprain fracture), it follows that whenever there is produced what appears to be a severe sprain with inability to move the joint and great pain and

swelling, it is important to secure surgical aid promptly. Many of these cases are found to be indeed fractures with sprains when they are examined by the x-ray. This is the only way by which even the most skillful surgeon can in many cases diagnose a fracture in injuries to joints because the great swelling obscures the ordinary signs.

**Symptoms.**—The symptoms of sprain are sudden. They are severe pain in the injured part, and are often accompanied by swelling, tenderness, and heat in the joint; faintness and nausea are frequently present. The sprained joint can only be moved with pain and difficulty. The swelling is due not so much to leaking of blood from broken blood vessels as to filling of the joint with fluid (serum) caused by inflammation. In severe sprains, however, the skin about the injury becomes "black and blue" from actual escape of blood from the torn blood vessels. In a badly sprained ankle the skin may be thus discolored almost up to the knee.

One should always try to discriminate between a dislocation, a break of bone, and a sprain. Usually in a sprain affecting the ankle, hip or knee the patient can walk a little, whereas in case a bone is actually broken this is commonly impossible. In fracture into a joint there is usually more motion than there should be when the joint is moved by another person. In dislocation the form of the joint is altered and the joint is immovable by the patient. The layman can but guess at the diagnosis.

**General Treatment.**—Since the treatment of severe sprains demands first of all discrimination between dislocation, a break of bone into a joint, or a true sprain with rupture of a ligament, capsule, or tendon of muscle, it follows that the methods herein described should only be followed in unmistakable sprains, or until a surgeon can be obtained, or when one is unobtainable. Nothing is better than immersion of a sprain for half an hour or more in water as hot as the hand will bear.

Following this one may apply strips of surgeon's plaster to the part, as described below, or an elastic flannel bandage cut on the bias about three and one-half inches wide may be applied from the toes or finger tips snugly well up the limb some distance above the injured



joint—the idea being to prevent swelling by keeping blood out of the part and to limit motion of the sprained joint.

In bandaging there is danger of swelling later, with increased pain, coldness, and blueness of the fingers or toes below the bandage, owing to too tight a bandage. The bandage must then be removed and reapplied with less force.

### SPRAIN OF THE BACK

#### *(Sacro-iliac Sprain)*

This sprain occurs in the lower part of the back at a point about two inches to the right or left of the center of the spine and about two inches below the upper border of the hip bone behind.

Its discovery has been comparatively recent and the condition is commonly called lumbago or sciatica, and may lead to incapacity for a life-time—if untreated—while treatment commonly relieves the trouble at once.

The sacro-iliac joint is made up of the union of the lower bone of the spine (sacrum) with the hip. The lower bone of the spine is here expanded into two horizontal bony wings which are mortised into corresponding depressions in the hip bone, thus supporting the whole trunk above this point. There is a similar joint then on each side of the spine.

The sprain is caused by falls, blows, and twists, by stepping from an unexpected height, and by lifting heavy weights. Pregnancy and labor in women may sprain the joint. Resting on a flat table on the back may cause the sprain during surgical operations. It may occur in those with relaxed muscles and with nervous prostration.

**Symptoms.**—Tenderness and pain are complained of about the joint at one of the points noted above. The pain is **not** limited to this region but is often felt in the groin and lower belly, down the leg behind and across the lower back. The pain or discomfort may be felt whether standing, sitting or lying, and especially on changing positions. The particular signs are those elicited by bending the body forward (the arms hanging down until the fingertips touch the floor) with the legs held together and without bending the knees;



also in bending the body from side to side in the same position. Or in lying flat on the back and holding each leg in turn straight in the air without bending the knee. In strain of this joint pain will be felt at once at the location of the joint on going through these tests. This may best be discovered by having another person press the thumb on the location of the joint while the patient goes through these motions. It is usual that only one joint is sprained, and then the pain is located more to one side of the back; occasionally both joints are sprained. In sacro-iliac sprain the body is apt to be arched toward the sound side and the shoulder lowered on the sprained side when the patient stands without clothing and is looked at from behind.

In lumbago there is no tender spot over the sacro-iliac joint, the pain is more general over the back and on both sides, the pain and tenderness are higher, above the hip bone, and pain is chiefly felt on getting up and sitting down, or standing, and not so much in lying quietly on the back. In sciatica there is tenderness over the middle of the upper and back part of the thigh instead of over the sacro-iliac joint.

**Treatment.**—The treatment usually has a remarkable curative effect. This consists in winding about the whole lower part of the body two-inch strips of zinc oxid adhesive plaster. Each strip overlaps the previous one half its width so as to make a thicker band. The ends meet in front in the lowest part of the belly and it may be necessary here to shave off the hair first. The first strip should be the lowest one and should be begun behind just above where the crease between the buttocks stops. One end of this strip is carried around to the middle line of the lower belly and the other end is drawn tightly across the lower back and about the other side and front of the belly to meet the first end. The whole width of the encircling plaster should be at least six inches from above the crease in the buttocks behind, but the ends may be overlapped in front so as to make a narrower band there. The plaster should be worn two weeks and replaced if necessary by a fresh one. Sometimes it is necessary that a canvas belt or plaster of Paris cast be fitted by a surgeon in order to secure a permanent cure. It is a disease which

requires skilled care where a surgeon can be obtained but one may obtain speedy and real relief by applying adhesive plaster as recommended. Soaking the plaster with alcohol or benzin will aid in its removal.

#### SPRAIN OF THE HIP

A true sprain of the hip is rare, as the joint is so well protected by powerful muscles. Bruises on the hip are common. In the case of any severe lameness and disability of the hip joint following an injury one should always think of a fracture in adults over middle age. In children tuberculous disease of the hip is commonly the cause of lameness in this joint.

**Symptoms.**—There is tenderness in sprain of the hip felt on pressure with the thumb just back of the most prominent upper and outer part of the thigh bone (great trochanter) on the outside of the hip.

**Treatment.**—In case of bruise or sprain of the hip the best treatment consists of rest in bed and the application of towels wrung out in hot water over the joint. These should be covered with a piece of oil silk or rubber cloth and then kept warm by means of a hot water bag. After a few days the leg should be moved in various directions while lying in bed and then the patient should be made to stand on his feet as soon as possible to avoid stiffness—especially in the case of old persons.

#### SPRAIN OF THE KNEE

This is caused by blows and falls as well as by a twist or strain; in other words it may be in reality a bruise or contusion as well as a sprain in the true sense of the word. The actual condition is much the same in either case. It is popularly called “water on the knee.”

**Symptoms.**—There is swelling of the knee joint, increased heat to the sense of touch, tenderness, especially on each side of the knee-pan, stiffness and pain on motion—particularly if the leg is bent on the knee as far as possible. The swelling is due chiefly to an increase of fluid in the joint so that soft swellings appear on either side above the knee-pan; the knee-pan itself appears to float and can be pushed down on the joint so as to touch the bone by a sudden,

quick motion of the thumb. This can only be done properly when the patient is lying flat on his back with the legs out straight and relaxed.

There are some conditions which should be distinguished from simple sprain or bruise of the joint. In case a portion of the cartilage, which acts as a sort of washer between the bones of the joint, becomes broken the patient will usually be aware of a floating body in the joint and may be able to see it and feel it at the side of the joint. There may be great swelling but little pain or lameness. When a whole cartilage gets displaced, the joint is suddenly locked in walking and this is followed by swelling and lameness for a few days.

**Treatment.**—In a severe sprain one of the (lateral) ligaments, binding the bones together at

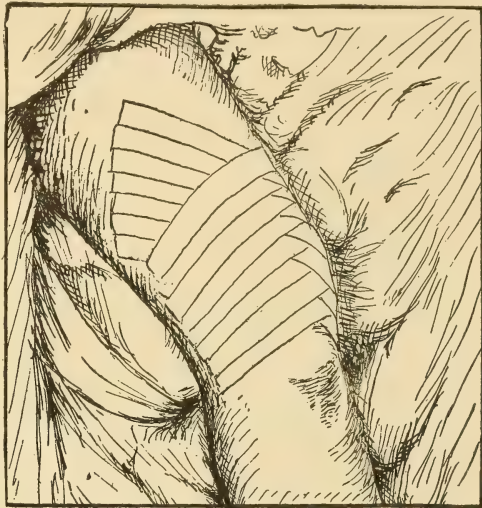


FIG. 1.—METHOD OF STRAPPING A KNEE. (After Donahue's "Manual of Nursing.")

each side of the joint, may be torn. In this case, the bones entering into the joint have more movement from side to side than they should. In moderate sprains the joint may be strapped with adhesive plaster as shown in Fig. 1. The strips of plaster an inch wide are drawn tightly across the joint in a diagonal direction. The plaster should reach about five inches above and below the joint and be brought around on the sides, but one should leave a space two inches wide behind the joint not covered with plaster—that is, the ends of the plaster behind the joint should not meet by two inches so as not to constrict the leg and shut off the circulation. Immediately after the injury the plaster is applied and the patient should rest in bed with an icebag over the knee until the following day, when he may walk about. In very severe sprains with much swelling and pain the patient should remain in bed with



a splint on the back of his leg, as recommended for broken knee-pan, with an icebag on the knee continuously until the soreness and heat have departed. Then the adhesive plaster may be applied and the patient may go about on crutches. The plaster should be removed if it stretches and fresh plaster applied, unless recovery has taken place. Sometimes sprains of the knee are treated by bandaging the joint with a flannel bandage, cut on the bias, four inches wide and fifteen feet long, or a rubber bandage may be used.

The bandage is removed once or twice daily for massage.

#### SPRAIN OF THE ANKLE

**Symptoms.**—In sprain of the ankle the foot is commonly turned in, with rupture of a part of the ligaments on the outside of the ankle joint; there is a special point of tenderness on pressure in front and below the bony prominence on the outside of the ankle. The ankle at once swells; there is great pain and inability to walk; and, in a day or two, blue and later green and yellow discoloration of the skin is seen, due to blood escaping from ruptured vessels. When this discoloration is particularly marked a fracture of the tip of the outer bony prominence (malleolus) of the ankle should be suspected and a surgeon's aid should be sought. An x-ray picture will solve doubts as to fracture.

**Treatment.**—The older treatment consisted in the use of hot water and bandaging, as described under the general treatment of sprains, but the writer for years has found immediate strapping with adhesive plaster very successful. Two strips of adhesive plaster twenty-eight inches long and two inches wide are prepared. The end of one of these is attached to the skin on the outside of the leg just below the knee; the plaster is then pressed against the whole of the outer side of the leg straight down to the heel: the free end is drawn as tightly as possible under the heel and up as far as it will go on the inside of the leg. The other strip is applied in just the same manner as the first, but on top and half overlapping it. This stirrup-like plaster prevents the ankle from bending from side to side. When it is applied the foot is held in just the position it would assume in standing upright with the inner borders of the feet in contact. It is



well to shave off the hair and bathe the leg with soap, warm water, and then with alcohol, before applying the plaster—the leg must be perfectly dry or the plaster will not stick. To increase the protection to the ankle, strips an inch wide should be applied so as to encircle the heel, the ends crossing on the top of the foot and reaching the base of the toes. The first strip is applied lowest down on the heel, the second half overlapping the first and so on upwards like the shingles on a roof. The plaster should be continued well above the ankle but here it should not be applied too tightly or, if swelling occurs and the plaster becomes too tight, it may be split right down the front of the ankle with blunt-pointed scissors. The author has found it safest in applying the plaster for the first time immediately after the

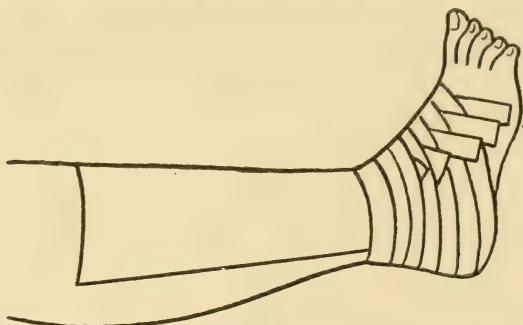


FIG. 2.—A GOOD METHOD OF STRAPPING A SPRAINED ANKLE WITH ADHESIVE PLASTER.

accident not to cross the ends of the plaster on top of the foot and on the front of the ankle, as shown in Fig. 2, but to cut the plaster so that the ends will exactly meet in front of the ankle and on top of the foot; then, if more swelling occurs, the ends of the plaster simply separate.

In very severe sprains it is recommended that the patient remain in bed and soak the ankle for one-half hour in a pail of very hot water at two or three hour intervals. Between these soakings a flannel bandage wet in hot water may be applied to the ankle and kept hot by the use of a hot water bag, while the foot is kept raised in bed on a pillow. Then after forty-eight hours of this treatment the surgeon's adhesive plaster may be applied to the ankle, as just described. But in most cases the plaster may be put on as soon as possible after the accident and a hot water bag or an icebag may be applied to the ankle over the plaster for the first twenty-four hours, while the patient remains in bed.

Walking should be encouraged after the first day as it hastens

recovery. Formerly it was the custom, after treatment with heat and rest for a few days, to place the ankle in a plaster of Paris cast and keep it thus for several weeks. At the end of that time many more weeks were required to rid the patient of the stiffness caused by this method. Now it is possible for patients to go about with a sprained ankle, after the first day, with the help of a crutch or cane for a few days. The plaster should be removed and replaced every five days or so and this should be continued for two weeks; it may be easily torn off, especially after soaking in gasoline, but this is as a rule not necessary, as it comes away in one piece. After the plaster is permanently removed stout tight-fitting lace boots should be worn and laced snugly to hold the ankle as in a splint.

### SPRAIN OF THE FINGERS OR THUMB

This is produced by a strain of the ligaments binding the bones to each other, or by a blow forcing the ends of two bones together. In the latter case most pain is produced when the bones of the injured joint are pressed together.

**Symptoms.**—There is swelling from increase of fluid in the joint, pain, and heat, and difficulty in moving the joint.

**Treatment.**—Plaster strips one-half inch wide for the fingers



FIG. 3.—ADHESIVE PLASTER STRAPPING FOR SPRAIN OF THE THUMB.

and one inch for the thumb, are applied, as in Fig. 3. The finger or thumb may be held partly bent—this is the easiest position. The strips are put on alternately from right to left and

from left to right, so that they shall cross each other nearly at a right angle. If the bandage becomes too tight it may be slit up the whole length on the under side of the bandage with blunt-pointed scissors. The joint should be moved as soon as possible to prevent stiffness, and the plaster, while supporting the joint, will allow of sufficient movement.

**SPRAIN OF THE WRIST**

In sprain of the wrist Colles' fracture should at once be thought of and any severe sprain of the wrist should be subjected to x-ray examination to eliminate the possibility of fracture of one or more of the small bones forming this joint.

**Treatment.**—A mild sprain may be treated by wrapping adhesive plaster about the wrist joint from the base of the thumb up the arm for three inches. Plaster strips an inch wide should be made to wholly encircle the wrist; one strip should overlap half the width of the strip preceding. Great care must be exercised not to apply the plaster tightly or the circulation in the hands and fingers will be impeded. At any time when this occurs the plaster should be cut straight up the front of the wrist with a pair of blunt-pointed scissors. In severe sprains the wrist should be soaked for half an hour in water, as hot as the hand will bear, and then a padded board one-fourth of an inch thick and a little wider than the arm should be applied to the palm surface of the hand, from the base of the fingers to within two inches of the elbow, by adhesive plaster and bandage, as for Colles' fracture.

This may be removed twice daily for soaking of the wrist joint in hot water and massage. The forearm and hand should be carried in a sling.

**SPRAIN OF THE ELBOW**

A surgeon's advice should always be obtained in apparent severe sprains of the elbow. It is impossible to form a correct idea of severe injuries of this joint without the use of the x-ray.

**Treatment.**—In sprains the immersion of the joint in hot water, as for the ankle, the bandaging with a flannel bandage carried from the wrist above the elbow, the use of a hot water bag or icebag in bed, and a sling when up and about, constitute the proper treatment at first; later moving the joint, bathing first in cold and then in hot water, and massaging with some liniment, are advised.

**SPRAIN OF THE SHOULDER**

**Symptoms.**—Under the large muscle (the deltoid) covering the outside of the shoulder is a sac (or bursa) the size of the palm of the



hand and containing fluid. This is often inflamed by blows and injuries which cause swelling on the top of the shoulder and tenderness at the joint of the shoulder. Pain is especially felt when the arm is raised at a right angle with the body, or when the elbow is bent at a right angle and the hand is moved out away from the body. The pain may be felt in the outside of the arm or even in the hand, as well as in the shoulder.

**Treatment.**—The patient should at first rest in bed with the arm stretched out on a pillow at right angles with the body; also painting the shoulder at one sitting with tincture of iodine, until it is stained very dark, will be of service. When sitting the arm should be held on a pillow on a table at right angles with the body so as to relax the shoulder muscle.

Cases usually recover without operation but occasionally removal of the sac is necessary. This condition is, strictly speaking, a bursitis and not a sprain.

## BRUISES

(*Contusions*)

A bruise is a hidden wound; the skin is not broken. It is an injury caused by a blunt instrument, as a punch with the fist or kick of the foot of man or beast. The skin may remain intact while the softer parts beneath are torn and crushed to a greater or lesser extent.

**Symptoms.**—The tearing of the smaller blood vessels causes the blood to escape under the skin and gives within a few hours the "black and blue" appearance common to bruises of any severity. In bruises of deeper parts this coloration may not appear for several days. Sometimes large collections of blood (hematoma) form under the skin owing to blows and give rise to considerable swellings. These occur on the scalp, under the breast, under the skin of the ear, etc. The use of the bruised part is temporarily limited. Pain, faintness, and nausea follow severe bruises and, in case of bad bruises of the abdomen by a kick of a horse, or wheel passing over the body, death may ensue from rupture of the internal organs and from fatal



bleeding internally. Furthermore, the bruise may be so great that the injury to muscle or nerve may lead to permanent loss of use of the part. For this reason a surgeon's advice should always be sought in cases of bad bruises. Pain is present in bruises owing to tearing and stretching of the smaller nerve fibers, and to pressure on nerves from swelling. The swelling is due to escape of blood and fluid from torn blood vessels.

**Treatment.**—In severe bruises, with faintness and nausea, the patient should be made to rest flat on his back, be covered warmly and be given two or three tablespoonfuls of whisky in twice as much water. Rest of the injured part is essential, together with compression, to prevent bleeding, inflammation, and swelling; elevation of an injured limb also assists the same end. The snug application of a flannel bandage cut on the bias is one of the best methods of treatment. In severe bruises and in the care of bruises in the aged, we use heat; in moderate bruises cold is more effectual at first. An icebag may be kept on the bandaged part held elevated on a pillow.

When a part cannot be bandaged, or before it has been bandaged, the application of a cold compress in moderate bruises is advisable. Two layers of old cotton or linen are wet in ice water and laid on the part, or alcohol and ice water are used in equal parts. As soon as the compress grows warm it should be replaced by another cold compress. In severe bruises and when cold is unavailable or unpleasant to the patient, several layers of flannel are wrung out in very hot water and applied to the injured part covered with oil silk or rubber. If a hot water bag is laid on the wet compress the heat will be long sustained—otherwise the compress will require constant renewal.

What is known as cataplasma kaolini is an excellent remedy for bruises when spread hot and thickly over the injured part and covered with a bandage. When the inflammation is subsiding an ointment containing twenty-five per cent. of ichthyol is a useful remedy, together with bandaging. Following severe bruises the damaged parts should be kept warm, as described, or by covering them with a two-inch layer of absorbent cotton and bandage until surgical advice may be obtained. When the pain and swelling begin to subside

in bruises, rubbing with liniment of ammonia is of service, and moderate exercise of the part is desirable. A bruise on a finger or toe-nail, sufficient to cause the parts under the nail to become bluish-red, may be very painful. In such a case the cutting of a narrow notch directly through and across the base of the nail sufficient to let out the blood is the proper treatment. A sharp jackknife, which has been boiled five minutes, may be used after the nail is washed with alcohol. The nail is raised from the soft parts beneath by blood, so that as soon as the nail is cut through the blood will escape. A piece of sterile gauze or boiled cotton cloth should be used to cover the wound in the nail for several days, by means of a bandage.

In bruises of the testicles there is apt to be considerable swelling and pain. The parts should be supported while the patient is in bed by a folded towel placed across the thighs under the scrotum. Then a mixture of equal parts of alcohol and water should be used to wet a handkerchief or soft cotton or linen, two layers in thickness. This compress should be kept on the injured parts and moistened as often as dry, or an icebag should be laid over the testicles.

When the patient is up an ointment containing twenty-five per cent. of ichthyol should be rubbed on the parts, and the testicles supported by a suspensory bandage which is kept by all druggists.

It may be necessary for a surgeon to let out large accumulations of blood caused by bruises on the scalp, ear, breast, etc.

#### ABRASIONS

When the surface is scraped off, as often happens to the shin, knee, head or hands, it should be covered with boric acid ointment or borated vaselin and a bandage. When the amount of skin removed is small and the part cannot be conveniently bandaged there is no better remedy than the compound tincture of benzoin which forms a coating over the part and is a powerful antiseptic. This is particularly useful when the knuckles are skinned, and for cracks on the skin or lip. It may be applied several times daily by wetting the cork of the bottle containing the benzoin.

**SMALL CUTS**

After a small cut made by a sharp instrument stops bleeding, and the skin about it is dry, the best form of treatment consists in covering it with collodion. The collodion may be applied by means of a small stick, as a toothpick or match with the head broken off. Collodion is not suitable for abrasions as it will not stick to moist surfaces and causes great smarting on raw parts.

## CHAPTER II

### DROWNING—ELECTRIC SHOCK—POISONING BY GASES

#### DROWNING

##### RESTORING THE APPARENTLY DROWNED

Take great care of the patient where he is landed or he will freeze. No time must be lost. Wipe off the nose and mouth and rip open the clothing about the chest and waist; separate the jaws and keep them apart by a cork or bit of wood; turn the patient on his face, having placed a large bundle of clothing under his stomach. Press heavily on the back over the stomach to squeeze all water



FIG. 4.—EXPELLING WATER FROM THE STOMACH AND LUNGS. (After Doty's "Prompt Aid to the Injured.")

out of the stomach and lungs, continuing as long as water flows freely from his mouth (*see* Fig. 4). Then turn him on his back and wipe away any discharge from the nose and mouth with the fingers. Place a pillow, or folded clothing between the shoulders,



and pull out the tongue. If there is nobody to hold the tongue out by means of a handkerchief wrapped around it, tie a string or strip of a handkerchief around the tongue and outside of the lower jaw to keep it from falling back. Or the tongue may be held between the teeth by tying a handkerchief under the chin and over the head. Next, while kneeling at the patient's head and facing his feet, grasp the patient's arms at the elbows and lift his arms upward until they touch the sides of his head; hold them in this position for a few seconds (*see* Fig. 5). This motion expands the chest. Now slowly bring the arms down along the sides and front of the chest, squeezing the air out of the chest in so doing (Fig. 6).

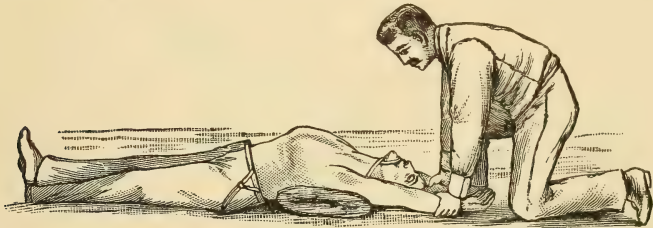


FIG. 5.—SYLVESTER'S METHOD OF ARTIFICIAL RESPIRATION. FIRST MOTION (INSPIRATION). (After Doty's "Prompt Aid to the Injured.")

Each movement should be done from twelve to sixteen times a minute. When an assistant is present he should make a strong upward pressure on the sides of the ribs and stomach, as the arms are being brought down to expel the air from the chest (*see* Fig. 7), and after a few seconds the assistant suddenly lifts his hands from the body, when the operator will again lift the patient's arms over his head. This method is more effective than can be done by one man alone. This artificial breathing should be continued for four hours if necessary, as persons have been revived who showed no signs of so doing until after two hours. Breathing begins in short gasps. Individuals have also been submerged under water for nearly an hour and yet have been resuscitated. If there are other assistants they should place hot water bags at the feet, being careful not to burn the patient, and dry and rub the limbs and belly and cover him warmly, but not so as to interfere with the artificial breathing operations.

When breathing has become normal cover the patient warmly from head to foot and give a little hot coffee or a tablespoonful of whisky or brandy in hot water every fifteen minutes, for the first hour, and afterwards as may seem necessary. The patient should keep perfectly quiet in bed for forty-eight hours, or he may be seized with congestion of the lungs. If this occurs there is great difficulty in breathing and if the patient gasps for breath artificial breathing may have to be instigated again.

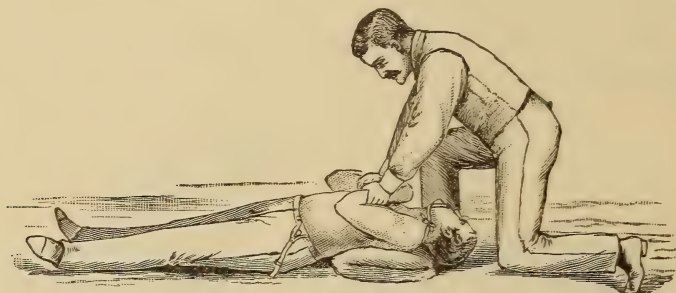


FIG. 6.—SYLVESTER'S METHOD OF ARTIFICIAL RESPIRATION. SECOND MOTION (EXPIRATION). (After Doty's "Prompt Aid to the Injured.")

The application of a large mustard poultice (one part of mustard and two parts of flour, mixed in a paste with warm water and spread between two old pieces of cotton) applied over the front of the chest, will often give immediate relief.

#### RESCUING A DROWNING PERSON BY SWIMMING

Before jumping into the water to rescue a drowning person throw off your coat and vest—and if there is time—your shoes, trousers, and drawers. The weight of the outer clothing, after it is completely water-soaked, is much greater than would be imagined. Cry out to the drowning person that he is safe. When you get close to the struggling person wait till he is pretty well used up and quiet before trying to aid him, or he will drown you. The writer has saved a person from drowning by waiting until the subject was quite unconscious and then seizing the hair with one hand while swimming on the back and side with the other.

By grasping the subject with one or both hands and swinging him

on his back, one can readily swim on one's own back with the feet alone, or float when tired. The only safe way then to attempt a rescue is: Grasp the hair, throw the subject on his back, and swim on one's own back. Do not touch the victim while he is violent and struggling. Take your time and wait for a boat, if one is at hand, and do not necessarily try to land the patient.

In diving for a person below the surface be guided by rising bubbles of air.

## ELECTRIC SHOCK

Lightning stroke is rare: statistics show that there is but one death in a million annually from this cause in the United States.

Electric shock from the commercial currents is a comparatively common occurrence. The cause of death is failure of the heart or of breathing. If the heart fails there is no practical way at present to restore it, but the breathing may be restored if the patient does not stop breathing over four or five minutes before respiration is artificially begun.

Different kinds of currents have different effects on the body. Thus the direct currents of high voltage tend to arrest the heart, while they affect the nervous system to cause unconsciousness, as by ether, and operations have been done without pain or consciousness under electricity given to animals. In the case of the alternating currents of high voltage the breathing is most apt to be arrested, while with currents of large amperage of low tension death from heart failure is most common.

The nervous system is the chief sufferer from currents of over 4,500 volts. But of even more consequence is the area, duration, and location of points of contact of current, and the resistance offered by dry clothing and skin to the penetration of the electricity. A dog may be killed by a current of 10 volts when the contacts are made to the head and hind legs, because the current then flows through the heart. A current of 80 volts is required of the same amperage, if contacts are made to the head and foreleg. Alternating currents of low frequency are most injurious and any



current tension higher than 200 volts is dangerous to life. A current of 95 volts has proved fatal to a man standing on an iron tank in wet boots. On the other hand, in one of the earlier attempts at electrocution, a man received a current of 1,700 volts (periodicity about 130) for 50 seconds and lived. A strong physique is most favorable for resisting the action of electricity. High tension alternating currents (1,300 to 2,000) are employed in electrocutions with contacts made to the head and leg, so that the current passes through the brain and heart. In industrial accidents such nice adjustments are fortunately almost impossible and shocks received from currents of 25,000 volts have not proved fatal because both voltage and amperage have been greatly lessened through poor contacts and resistance of dry clothing and skin, and because the heart has not been included in the circuit.

Death is induced in one of three ways: (1) currents of enormous voltage and amperage, as occur in lightning, actually destroy, burst, and burn the tissues through which the stroke passes; (2) death from contraction of the muscles of the heart, the effect being much the same as that observed in other muscles. The heart instantly stops beating in a state of contraction, or there is a fine quivering of the muscular fibers, but the normal pulsations are not resumed; (3) the effects of the current on the nerve centers in the brain may arrest breathing.

Most of the industrial currents are alternating, of varying frequency and of high voltage and large amperage and, according to the foregoing, cause death by failure of respiration.

**Symptoms.**—These are usually general muscular contractions or, if the current has passed through the head, sometimes convulsions and unconsciousness with failure of pulse and breathing. Unconsciousness often lasts but a few moments in non-fatal cases, but may continue for hours, and is not at all unfavorable if the pulse and breathing are satisfactory. Bad after-effects are rare. Occasionally there is temporary, muscular weakness. A man who was removing a brush from a trolley car touched, with the other hand, a live rail; his muscles immediately contracted and threw him from contact with the current (500 volts). He fainted, the breath-



ing was feeble and rapid but later slow, the pulse was rapid and weak; on regaining consciousness, he vomited and was on his feet, although he was feeling very weak for two hours. This is a mild case.

Burns of varying degrees of intensity occur at the point of entrance of the current, from slight blisters to complete destruction of all the tissues at this point. The treatment is the same as for burns in general.

**Treatment.**—Artificial respiration should always be kept up until a medical man takes care of the case, as the layman cannot surely know whether or not the patient is dead, and patients have been restored after two hours of artificial respiration.

### 1. BREAK THE CIRCUIT IMMEDIATELY

(1) With a single quick motion separate the victim from the live conductor—in so doing avoid receiving a shock yourself. Many have, by their carelessness, received injury in trying to disconnect victims of shock from live conductors. Observe the following precautions:—

(a) Use a dry coat, a dry rope, a dry stick or board, or any other dry nonconductor, to move either the victim or the wire, so as to break the electrical contact. Beware of using metal or any moist material. The victim's loose clothing, if dry, may be used to pull him away; do not touch the soles or heels of his shoes while he remains in contact—the nails are dangerous.

(b) If the body must be touched with your hands, be sure to cover them with rubber gloves, mackintosh, rubber sheeting or dry cloth; or stand on a dry board or some other dry insulating substance. If possible, use only one hand. If the victim is conducting the current to ground, and is convulsively clutching the live conductor, it may be easier to shut off the current by lifting him than by leaving him on the ground and trying to break his grasp.

(2) Open the nearest switch, if that is the quickest way to break the circuit.

(3) If necessary cut a live wire; use an ax or hatchet with a dry wooden handle, or properly insulated pliers.

## 2. ATTEND INSTANTLY TO THE VICTIM'S BREATHING

(1) As soon as the victim is clear of the live conductor, quickly feel with your finger in his mouth or throat and remove any foreign body (tobacco, false teeth, etc.). Then begin artificial respiration at once; every moment of delay is serious.

(2) Lay the subject on his back with a large roll of clothing under his shoulders and with arms stretched as straight forward as possible and the wrists fastened together. Let an assistant draw forward the subject's tongue. If possible, avoid so laying the

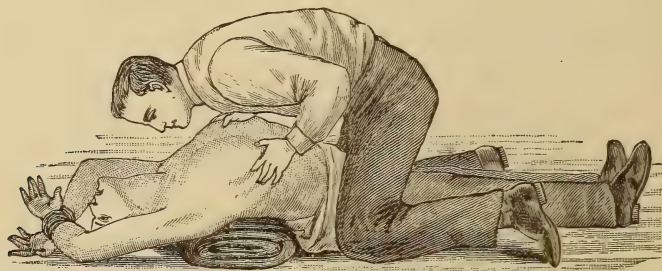


FIG. 7.—ARTIFICIAL RESPIRATION. HOWARD'S METHOD. (After Doty's "Prompt Aid to the Injured.")

subject that any burned places are pressed upon. Do not permit bystanders to crowd about and shut off the air.

(3) Kneel, straddling the subject's thighs and facing his head; rest the palms of your hands on the muscles of the sides of the chest, with thumbs nearly touching each other, and with fingers spread over the lowest ribs (*see* Fig. 7).

(4) With arms held straight, swing slowly forward so that the weight of your body is gradually brought to bear on the subject. This operation, which should take from two to three seconds, must not be violent—internal organs might be injured. The lower part of the chest and also the abdomen are thus compressed, and air is forced out of the lungs.

(5) Now immediately swing backward so as to remove the pressure, but leave your hands in place, thus returning to the first position. Through their elasticity, the chest walls expand and the lungs are thus supplied with fresh air.

(6) After two seconds, swing forward again. Thus repeat deliberately twelve to fifteen times the double movement of compression and release—a complete respiration in four or five seconds. If a watch or clock is not visible, follow the natural rate of your own deep breathing, swinging forward with each expiration and backward with each inspiration. While this is being done, an assistant should loosen any tight clothing about the subject's neck, chest, or waist.

(7) Continue artificial respiration for two hours or longer, without interruption, until natural breathing is restored or until a physician arrives. Even after natural breathing begins, carefully watch that it continues; if it stops, start artificial respiration again. During the period of operation, keep the subject warm by applying a proper covering and by laying beside his body bottles or rubber bags filled with warm (not hot) water. The attention to keeping the subject warm should be given by an assistant or assistants.

(8) Do not give any liquid by the mouth until the subject is fully conscious.<sup>1</sup>

## POISONING BY GASES

In rescuing a person from a room filled with gas or smoke one should cover his nose and mouth with a cloth wet with water or vinegar and, taking a full breath, should rush for the nearest window and open or break it to get a sufficient supply of air. The other windows and doors should then be opened. Never take a light or strike a match in a room full of gas—in this way an explosion will be avoided. Remove the patient at once to a pure atmosphere and try to revive him by artificial breathing, as described elsewhere in this volume. The machine called the pulmotor, or lung motor, which automatically sustains breathing, is of great value and more efficient than any other means. It is now a part of the necessary appliances kept on hand by city hospitals, fire houses and others called upon to treat medical and surgical emergencies.

<sup>1</sup>Rules of the Commission on Resuscitation from Electric Shock of the National Electric Light Association. The method of performing artificial respiration is Howard's, and not that described by the Association.

Suffocation in houses is apt to occur from escaping illuminating gas and also from charcoal and coal gas. The treatment of those suffocated by gas in mines, wells, and sewers is precisely the same as that described above.



## CHAPTER III

### UNCONSCIOUSNESS AND CONVULSIONS

Heat prostration. Heat stroke. Fainting. Intoxication. Head injuries. Apoplexy. Kidney disease. Epilepsy. Hysteria. Diabetes. Shock. Poisoning by opium, carbolic acid, and strychnin. Convulsions in infants and adults.

**General Treatment.**—The patient's head should be moved as little and as carefully as possible. He should be put to bed or flat on his back, or if the breathing is of a snoring, noisy, or rattling character, turn the patient carefully on his side so that the tongue will not fall back. Loosen the clothing about the neck and body, and replace it with night clothes if possible. Do not try to make the patient swallow anything until consciousness has returned, or it may choke him, or go down into the lungs. Mistaken kindness frequently results in attempts to pour whisky down the throat of an unconscious person.

If there is an injury to the head or the face is red, put ice to the head in a rubber bag, sponge bag, or towel, and keep the feet warm with hot water bags or bottles.

Give the patient plenty of air and do not let bystanders crowd about him.

**Causes.**—In adults brain injuries or disease, acute diseases, poisons, and heart disease are the most common causes of unconsciousness. Among diseases of the brain, apoplexy, epilepsy, sun-stroke, and meningitis are common. Among poisons alcohol, chloral, opium, illuminating gas, and the poisons produced by Bright's disease and diabetes are frequent causes of unconsciousness. Simple fainting is the most common cause of short insensibility, but organic disease of the heart may also be present. Hysteria

may be a cause, especially in women, and convulsions in children. Convulsions or fits may be feigned to obtain money or drink.

Get all the information possible from bystanders as to whether there has been any injury or previous sickness. Examine the head and body for broken bones. Take the temperature by placing a thermometer in the bowel, if possible. A temperature over 100° F. may mean acute disease, such as typhoid fever, pneumonia, meningitis, sunstroke. A pulse of 60 or under suggests brain injury or disease.

Consider the color of the face: if it is flushed and bluish it may mean apoplexy or epilepsy; if pale it may mean fainting or shock from injury. Has the patient bitten his tongue? If so, there is a probability of a previous epileptic fit. The odor of alcohol in the breath does not necessarily mean drunkenness. Find out how much alcohol the patient has had and examine into the other points mentioned. Examine the mouth. The swallowing of carbolic acid turns the lips and tongue whitish.

Is there any swelling about the ankles so that the finger tip pressed firmly on the flesh covering the shin bone above the ankles leaves deep imprints? This, with a previous history of vomiting, suggests Bright's disease of the kidney as the cause.

Touching the central part of the eyeball lightly with the finger tip will show the depth of unconsciousness. If the patient is but partly unconscious he will try to wink and frown, but if wholly insensible he will make no motion. In unconsciousness due to apoplexy there is paralysis of one whole side of the body; lift the two legs and let them fall and see if one side appears to be lifeless as compared to the other.

Unconsciousness is often associated with convulsions. Inquire if there have been convulsions as they always occur in epilepsy, and the tongue has often been bitten. Fits are also seen in head injuries and disease, in strychnin poisoning, in Bright's disease, occasionally in fainting, and often in hysteria, and in fevers and digestive diseases of infants. The patient may apparently be wholly unconscious in hysteria and insensible to pain, noise and light; this is not the case, however, for dashing cold water on the face will

often cause struggling; or covering the nose and mouth may lead to resistance; and trembling of the eyelids and rolling up of the eyeballs are common in hysteria. The patient is often very stiff and bends backward. There may be confused talk or screaming. Hysteria occurs more often in women and after some emotional excitement.

## SUNSTROKE

### HEAT PROSTRATION—HEAT STROKE

There are two very distinct types of sickness from heat commonly included under the name of sunstroke. Either may occur in persons exposed directly to the sun's rays or in those exposed to great heat out of the rays of the sun. Heat stroke is seen more often in persons working out in the sun, however.

### HEAT PROSTRATION

In this condition there is faintness and great weakness; the face is cool and pale; nausea, vomiting, and dizziness may be present and sometimes actual unconsciousness. There is no fever, the temperature is normal or below.

**Treatment.**—Assist the patient to lie flat on his back, and loosen the clothing about the neck and waist. Lift the foot of the bed two feet higher than the head. Give plenty of air. Sprinkle ice water on the face and hold smelling salts to the nose. When the patient can swallow give a tablespoonful of whisky or brandy in a little water, or one-half teaspoonful of aromatic spirit of ammonia in one-half a cup of water. Make the patient lie quietly for some time after the faintness has passed.

### HEAT STROKE

In this condition there are flushed face, hot skin, high fever (the thermometer in the bowel may show 107° to 110° F.), and rapid and complete unconsciousness with noisy breathing. It may appear suddenly with nausea, dizziness, headache, and the patient may fall

insensible to the ground. The muscles are usually relaxed, but sometimes there are twitchings or even convulsions.

In comparing the two forms it will be seen that in heat prostration we have a condition of faintness, while in heat stroke there is a state with hot skin, red face, and insensibility, which looks more like intoxication or apoplexy. The thermometer settles the diagnosis.

Heat prostration is frequently seen in those working in hot rooms, as laundries, boiler rooms, and stoke holes. It occurs more often in those weakened by overwork, poor food and excesses in alcohol. It is not infrequent in children. It is seen more commonly in men wearing thick clothing, working in great heat, and exposed to the sun, and especially in those under the influence of alcohol. Heat prostration with proper care, usually is of short duration. In heat stroke delirium and unconsciousness may last for days. Diminution of fever and returning consciousness herald recovery, but it is a very fatal disease—more than a third of the cases dying. In fatal cases the pulse weakens, the insensibility is profound, and the breathing is gasping, with long intervals. When the patient survives there is commonly great sensitiveness to moderate heat for many years after. Loss of memory, weakened mental capacity, headache, irritability, impairment of sight and hearing are all seen as sequels, particularly in those who drink or are exposed to hot weather. Cramps in the muscles are frequent in those working about furnaces in hot rooms. Sunstroke is more common in a sultry moist atmosphere than in places possessing dry air, but higher temperature.

There is no explanation for the greater frequency of the disease in some regions as compared with others having apparently the same general atmospheric conditions.

**Treatment.**—Ice wrapped in a towel should at once be applied to the head. The patient must be stripped of clothing and placed in a bath tub containing ice water, and should be rubbed all over with ice, keeping ice on the head; or he may be placed in a cot and wrapped in a sheet wrung out of ice water and the outside of the sheet rubbed with ice. A lump of ice should be kept at the nape of the neck. This rubbing of the body with ice is



essential whether the patient be in a bath or covered by a sheet. The friction stimulates the nervous system and circulation and thus prevents the blood from being driven into the internal organs by the cold applied externally. The cold water treatment is applied until the temperature of the patient has been reduced to normal (98.6° F.), or within a few degrees of it. Then the patient is put to bed with an icecap on his head and kept there until he recovers. It often happens that fever returns, in which case the whole process of applying cold water must be repeated. While the patient is insensible no attempt should be made to give him anything by the mouth, but one-half pint of milk containing two raw eggs and a large pinch of salt may be warmed to the body temperature and injected into the bowel every eight hours, after washing the bowel out with cold water on each occasion.

If the pulse is weak four tablespoonfuls of whisky or brandy may be added to the milk. If the urine is not passed spontaneously it will be necessary to draw it once in every eight hours with a soft rubber catheter which has been boiled for ten minutes and lubricated with glycerin, the hands of the operator being scrupulously clean.

It goes without saying that a physician's services are imperative in any form of sunstroke.

## FAINTING

(*Syncope*)

Fainting is the most frequent cause of unconsciousness. It is a condition of temporary insensibility due to insufficient blood supply to the brain. This is brought about through weakness of the blood vessels, so that the blood is not distributed uniformly about the body, or through weak action of the heart caused by general exhaustion or weakness, pain, fright, excitement, nervousness, and anemia. Great loss of blood will of course produce fainting. Certain odors and sights produce fainting, even in robust persons, as the sight of blood or surgical operation. Fainting is apt to be a habit in some persons, more often in women. It is more prone

to occur at gatherings where the air is warm and close. The blood vessels then are relaxed and the blood withdrawn from the head. At the first feeling of faintness one may avoid fainting by stooping down, with the head below the knees.

Most cases of fainting are not dependent upon real heart disease, and it is not usually a serious matter, except in persons over fifty when it often means disease of the heart, brain or kidneys.

**Symptoms.**—In fainting the patient often feels dizzy and weak and becomes very pale. If insensibility is complete he falls and the breathing and heart apparently may stop or be so feeble that neither the respiration nor pulse are perceptible. This is but momentary, however. Rarely there are slight convulsive movements so that the patient may appear to be in a fit.

**Treatment.**—The first thing to do is to lay the patient flat on his back, and raise his legs higher than his head so that the blood will flow into his brain; there should be no pillow under the head.

The clothing should be loosened about his neck and body, and cool air should be let into the room to stimulate contraction of the blood vessels. Sprinkling cold water on the face and the application of smelling salts, or inhalation of ammonia from a bottle, are useful. The patient should not be given anything by the mouth until able to swallow, and then a tablespoonful of whisky or brandy in a little water may be reviving.

The patient must remain on his back for some time after recovering from the attack.

## INTOXICATION

Unconsciousness from other conditions is frequently set down to drunkenness when the odor of alcohol is present in the breath. The patient may have fallen and fractured his skull when drunk, or have an attack of apoplexy due to drink. He may not be drunk at all, but may simply have had a drink, or been given one for injury or disease. In drunkenness there may be a history of drinking and an alcoholic breath.

**Symptoms.**—The patient can generally be aroused by shouting or shaking and will make some muttering reply which is not so apt to occur in apoplexy or fractured skull. The face is flushed, and the breathing deep, but not so noisy and snoring, as in apoplexy. The pulse in intoxication is rapid and not so slow (60 or below) as in opium poisoning, and often in apoplexy and injuries and diseases of the brain.

**Treatment.**—Ordinary intoxication will pass off without any treatment but sleep and rest.

If the pulse is weak one-half teaspoonful of aromatic spirit of ammonia in one-half glass of water will aid recovery. If the stupor is profound arouse the patient by giving douches of cold water on his head and striking his bare skin with a wet towel. Then give a dessertspoonful of mustard, with a teaspoonful of common salt, in a glass of tepid water to empty the stomach. After that give three compound cathartic pills to move the bowels and put the patient to bed. If the pulse is weak repeat the ammonia and give strong coffee.

## HEAD INJURIES

### CONCUSSION

The simplest form of unconsciousness from a fall or blow on the head is that due to concussion or jarring of the brain.

**Symptoms.**—Here the insensibility may be short, the patient may be pallid, weak and confused, and have nausea or vomiting on recovery.

In the severer forms the patient is unconscious but may reply in monosyllables to shouting. If the patient moves all his limbs there is no paralysis; the latter may occur in severe head injuries. Occasionally there are convulsions. Recovery of consciousness in severe concussion of the brain usually ensues within twenty-four hours, but headache, dizziness, and incapacity for mental work may persist for a considerable time.

There is a possibility for brain abscess, inflammation, epilepsy, or relapse into unconsciousness after a time, if the patient does not rest.

**Treatment.**—The general treatment for unconsciousness described above is advisable, with icebags or cold cloths to the head and hot water bags at the feet, and prolonged rest in bed. The patient should live a quiet life for some time, not returning to business for several weeks.

#### COMPRESSION OF THE BRAIN

**Symptoms.**—In the more severe head injuries, known as compression of the brain, from the escape of blood and formation of clots between the brain and skull, or from breaking or fracture of the bones of the skull, with pressure on the brain, there are: complete unconsciousness, so that the patient will not respond to any effort to arouse him, snoring breathing, slow pulse, and wide or unequal pupils, which do not contract when exposed to a bright light. There is often paralysis of one side of the body.

#### FRACTURE OF THE SKULL

**Symptoms.**—In fracture of the skull there may be no external sign, although there may be a depression in the skull, or the broken bones may be felt grating together when the parts are pressed upon. A continuous flow of bloody or watery fluid from the ear is usually a sign of fracture of the skull after injury, and also the appearance of blood staining the white of the eye or lid, a day or two after the accident.

**Treatment.**—A surgeon should be summoned at any cost in a case of delayed unconsciousness. When there exists any possibility of a head injury in an unconscious person the entire head should be shaved, as only then may swelling or abrasions be seen.

The treatment is the same as that recommended for concussion until skilled assistance is obtained.

#### APOPLEXY

This is a form of unconsciousness due to pressure of a blood clot on the brain resulting from the spontaneous rupture of a blood vessel. It is more likely to attack men over fifty years of age.



**Symptoms.**—The face is flushed and of a bluish hue. The breathing is often loud, rattling and of a snoring character, and may be irregular. The cheeks flap in and out, and the lips sputter. The patient moves the arm and leg on one side of the body while the other side lies motionless and is paralyzed. The face may be paralyzed on one side, the lips being puffed out on that side in breathing. There is usually complete insensibility so that the patient cannot be roused. The pupils of the eyes are not equal in size. The limbs are entirely relaxed or stiff on the paralyzed side of the body, and the face is often turned to the sound side.

While the person with apoplexy may also be under the influence of alcohol, yet apoplexy may be distinguished from intoxication by the facts that in intoxication the patient can be temporarily roused by shouting, and there is no paralysis on one side of the body, and the pupils are equal in size.

**Treatment.**—The patient should be placed on his back with his head raised, or turned on his side if his breathing is very noisy. Cold cloths or ice should be placed at his head and hot water bags at his feet.

Do not try to give food or drink, especially alcohol, while the patient is unconscious. Five grains of calomel may be dropped on the back of the tongue, however. And the urine may have to be drawn off with a catheter every eight hours. After a variable time, from a few hours to many days, the patient may return to consciousness—usually to suffer from paralysis for a longer or shorter period. Death may occur while the patient is still unconscious.

Patients who are in bed for long periods, with paralysis, must be kept very clean, and turned from time to time to avoid bed-sores from pressure in the lower part of the back. Bathe such parts frequently with alcohol and water and see that the bed clothing under the patient is not wrinkled.

## KIDNEY DISEASE

This condition may be a cause of unconsciousness, called uremia. It is due to the retention of certain poisonous matters which should

be eliminated from the body in the urine. A previous history of vomiting, headache, dizziness and sleeplessness may be obtained, and the face of the patient may be pale and bloated, with swelling of the eyelids and ankles from dropsy. The breath and skin may have an odor of urine. The unconsciousness is often preceded by convulsions.

It is, however, usually impossible for the layman to make a correct diagnosis of the condition.

### **EPILEPSY**

The unconsciousness begins with a fit. The tongue may be bitten; there may be a history of such attacks, and the patient usually regains consciousness in a short time, although occasionally there is a prolonged period of insensibility.

### **HYSTERIA**

Apparent insensibility and convulsions are seen in hysteria. This is a nervous disease, in which the emotions control the body, more often attacking young women.

**Symptoms.**—The patient, owing to some emotional excitement, begins by alternately crying and laughing and has a sensation as of a lump in the throat and of choking and difficulty in getting breath. She then often falls, apparently unconscious and in convulsions. In falling the patient usually manages not to hurt herself and rarely bites the tongue, as in epilepsy. The arms, legs and head are thrown about in a wild manner. After a few minutes the attack may cease and the patient begins crying again and may regain consciousness. Often the patient may remain for a long time in an apparently unconscious condition, with little movement of the body which may assume various postures and be held perfectly rigid. The history of similar attacks beginning with weeping and laughing, the feeling of a lump in the throat, and the fact that the patient has never been hurt in the convulsions, as occurs

in epilepsy, will suggest hysteria very strongly. Covering the nose and mouth may cause resistance, and rolling up of the eyeballs and trembling of the eyelids are common in hysteria.

**Treatment.**—Hysteria must be regarded as a disease and the patient should not be treated unkindly; but on the other hand sympathy may aggravate the condition. While the patient may be apparently unconscious she can hear what is said. It is well then in a loud voice to tell some one in the room that the patient is in no danger and that the attack will pass soon. This naturally comes with more authority from a doctor.

The patient should then be left alone in a darkened room, or, if the attack is severe, the sudden dashing of a large pitcherful of cold water on the face and head of the patient will usually quickly restore her.

Hysteria may stimulate almost any other disease and its vagaries are myriad. Only the form is here considered in which convulsions and insensibility predominate.

## DIABETES

A large number of patients with diabetes die in unconsciousness or coma. The breath has a fruity, sweet odor likened to that of apples or pears, or to wine. There are no previous convulsions, but the patient may have had headache, dizziness, and a staggering gait. One may find that the patient has been previously treated for diabetes. The finding of sugar in the urine is not positive proof of the condition.

## SURGICAL SHOCK

This is a condition in which there may be partial unconsciousness. Shock is profound depression of the nerve centers, particularly those controlling the blood vessels. With this control lost the great veins in the abdomen dilate, thus collecting most of the blood in the body; in consequence the heart and brain suffer from loss of blood supply. Shock is commonly produced by injuries as

by falls, blows, wounds, fractures, surgery, shooting, burns; and also by great fear or grief, loss of blood, and exposure to cold.

If nerves leading from the seat of injury to the brain are temporarily disabled by injection of cocain, shock may be prevented.

This is now done in surgery. Shock may come on suddenly, or after hours, as following railroad accidents. It may be slight and short, or severe and prolonged, or death may occur suddenly from shock.

**Symptoms.**—A patient with shock will lie quiet, pale, limp and indifferent, with partially closed eyes. The skin is pale, cold and clammy. The breathing is faint or gasping, the pulse feeble and rapid or imperceptible, the pupils are dilated, and the temperature below normal. The patient may answer questions, but his replies are usually wholly unreliable then and later concerning that period. Pain is not felt.

Vomiting may herald reaction with beginning recovery. The color grows better, the skin warmer, and the breathing and pulse become stronger.

**Treatment.**—The head should be lowered by lifting the foot of the bed on a chair or on boxes. Hot water bags should be placed about the patient, being careful not to burn him. He should be warmly covered with blankets and the lower limbs bandaged from toes to groin.

The slow injection into the bowel of two quarts of water (as hot as the hand can comfortably bear) containing four level teaspoonfuls of salt and one-half cupful of brandy or whisky is of great value, except in shock from loss of blood. The water should flow from a fountain syringe hung about a foot above the patient, and the patient must be kept covered while the injection is given. Mustard plasters should be placed over the heart and spine.

Giving stimulant by the mouth in shock is useless. Even injecting ordinary agents, as alcohol and strychnin, under the skin does little good—the injection by a doctor of one-quarter of one grain of morphin sulphate, and of one one-hundredth of one grain of atropin sulphate, are of service. If a surgeon can inject adrenalin chlorid solution into an artery this will accomplish most.



Performing artificial breathing by alternating pressure on the sides of the lower part of the chest may be of value. When the patient improves hot coffee may be given by the mouth.

## POISONING

Unconsciousness may be due to poisoning by many chemicals. Poisoning by alcohol, gases and the special poisons of Bright's disease and diabetes have been mentioned. Poisoning by opium or morphin, carbolic acid, and strychnin will produce unconsciousness.

In opium poisoning the patient can usually be aroused somewhat by shaking and shouting; the breathing and pulse are very slow and the pupils of the eyes are reduced to pin points.

In carbolic acid poisoning there are white marks on the lips from burning, and the odor of the acid is perceived.

In strychnin poisoning there are convulsions also, when the patient is so bent and rigid that he will rest on his head and heels.

## CONVULSIONS

### CONVULSIONS IN CHILDREN

**Treatment.**—Hold the child in a warm bath with a cold cloth on the head; repeat the same treatment if the convulsions return. Send for a doctor.

### CONVULSIONS IN ADULTS

#### (Fits)

**Treatment.**—Loosen the clothing about the waist and neck. Place a cork or bit of wood between the teeth to prevent biting of the tongue. Keep the patient from falling off the bed or better lay the patient on the floor. Crush a pearl of amyl nitrite (kept by druggists) on a handkerchief and hold this close to the patient's nose and mouth until he becomes relaxed. Do not try to rouse the patient from his sleep after his fit has passed.

**Cause.**—The most common cause of such fits is epilepsy.

## CHAPTER IV

### FRACTURES OR BROKEN BONES<sup>1</sup>

Broken rib. Collar bone. Lower jaw. Nose. Shoulder blade. Arm. Fore-arm. Wrist. Hand. Fingers. Hip. Thigh. Kneepan. Leg. Ankle. Foot. Toes. Compound fractures.

It frequently happens that the first treatment of fracture devolves upon the inexperienced layman. Immediate treatment is not essential, in so far as the repair of the fracture is directly concerned, for a broken bone does not begin to unite for a week or so, and if a fracture were not seen by the surgeon for several days after its occurrence, no harm would be done provided that the limb were kept quiet in fair position until that time. The object of immediate care of a simple fracture is to prevent pain and avoid damage which would ensue if the sharp ends of the broken bone were allowed to injure the soft tissues during movements of the broken limb.

**When Immediate Treatment is Necessary.**—The foregoing remarks apply to simple fractures but when there is a wound near the seat of fracture, or when the ends of the broken bones actually project through the skin, then immediate treatment is essential to save the patient's limb or life (*see* Compound Fracture).

Fractures are partial or complete, the former when the bone is broken only part way through; simple, when the fracture is a break of the bone, and compound, when there is an external wound communicating with the seat of fracture and allowing the air with its germs to enter the wound, thus greatly increasing the danger.

<sup>1</sup> It should be distinctly understood that the information about fractures is not supplied to enable anyone to avoid calling a surgeon; it is to be followed only until expert assistance can be obtained and, like other advice in this book, is intended to furnish first-aid information or directions to those who are in places where physicians cannot be secured.

**Causes.**—To be sure that a bone is broken we must consider several points. The patient has usually fallen or has received a severe blow upon the part. This is not necessarily true, for old people often break the thigh bone at the hip joint by simply making a false step.

**Symptoms.**—Inability to use the limb and pain first call our attention to a broken bone. Then when we examine the seat of injury we usually notice some deformity—the limb or bone is out of line, and there may be an unusual swelling. But to distinguish this condition from sprain or bruise, we must find that there is a new joint in the course of the bone where there ought not to be any: e. g., if the leg were broken midway between the knee and ankle, we should feel that there was apparently a new joint at this place, and perhaps the ends of the fragments of bones would be heard or felt grating together.

**Tests.**—These, then, are the absolute tests of a broken bone:—movement in an unusual site in the course of the bone, and grating of the broken fragments together. The latter will not occur, of course, unless the fragments happen to lie so that the ends touch each other. In the case of limbs, sudden shortening of the broken member from overlapping of the fragments is a sure sign.

## SPECIAL FRACTURES

### BROKEN RIB

A rib is usually broken by direct violence, as by falls, blows, crushing.

**Symptoms.**—The symptoms are pain on taking a deep breath, or on coughing, together with the finding of a small, very tender point on pressure. This is found by passing the finger tip along each rib in turn in the region of the pain. Unusual movement or grating may be felt at the place of fracture on deep breathing. The existence of a very tender spot on a rib after an injury means a probable fracture. Deformity is not usually evident, so that nothing in the external appearance may call the attention to fracture. Grating

between the fragments may be heard by the patient or by the examiner, on placing his ear over the painful spot, and the patient can often put his own finger on the exact location of the break.

**Treatment.**—When there is doubt whether a rib is broken or not the treatment for broken rib should be followed for relief of pain.

The treatment consists in applying a wide band of surgeon's adhesive plaster, to be obtained at any drug shop. The band is made



FIG. 8.—STRAPPING WITH ADHESIVE PLASTER FOR BROKEN RIB.

by overlapping strips, three inches wide, till a width of nine inches is obtained. This is then applied by sticking one end along the back bone and carrying it forward around the injured side of the chest over the breastbone as far as a line below the armpit on the uninjured side of the chest, i. e., three-quarters way about the chest (*see* Fig. 8). These three-inch strips may be cut

the right length first and laid together, overlapping about two inches, and put on as a whole, or, what is easier, each strip may be put on separately, beginning at the spine, four inches below the fracture, and continuing to apply the strips, overlapping each other about two inches, until the band is made to extend to about four inches above the point of fracture—all the strips ending in the line of the armpit of the uninjured side. Each strip should be quickly put on, while the patient lets out all his breath, as at this time the ends of the bones are more nearly together.

If surgeon's plaster cannot be obtained, a strong unbleached cotton or flannel bandage, a foot wide, should be placed all around the chest and fastened as snugly as possible with safety pins, in order to limit the motion of the chest wall. The patient will often be more



comfortable sitting up, and should take care not to be exposed to cold or wet for some weeks, as pleurisy or pneumonia may follow. The sharp ends of the broken rib may injure the lung and there may then be spitting of blood, and air may escape from the lung under the skin, giving one a crackling sensation when the skin is touched. In such a case, in the absence of a doctor, the patient should be kept in bed and be given a tablespoonful (adult dose) of paregoric<sup>1</sup> in water, to prevent coughing and quiet the patient. Three weeks are required for firm union to be established in broken ribs.

### COLLAR BONE FRACTURE

Fracture of the collar bone is one of the commonest accidents. The bone is usually broken in the middle third.

**Symptoms.**—A swelling often appears at this point and on press-



FIG. 9.—SLING FOR COLLAR BONE FRACTURE.



FIG. 10.—SLING FOR COLLAR BONE FRACTURE.

ing gently on either side of the break it may be possible to feel movement of the broken fragments. There is inability to use the arm (on the side of the break) and there is pain at the site of the break, especially on lifting the arm up and away from the body. It will be noticed that the shoulder, on the side of the injury, seems

<sup>1</sup> Paregoric is a powerful drug (opium) and is only sold on a doctor's prescription.

narrower and also lower than its fellow. The head is often bent toward the injured side, and the arm of the same side is grasped below the elbow by the other hand of the patient and supported, as in a sling.

In examining an apparently broken bone the utmost gentleness must be used or serious damage may result.

**Treatment.**—The best treatment consists of rest in bed on a hard mattress; the patient lying flat on the back with a small pillow



FIG. 11.—TREATMENT OF FRACTURE OF THE COLLAR BONE.

between the shoulders and the forearm of the injured side across the chest. This is a wearisome process, as it takes from two to three weeks to secure repair of the break; on the other hand, if the forearm is carried in a sling, so as to raise and support the shoulder, while the patient walks about, a serviceable result is usually obtained, the only drawback being that an unsightly swelling remains at the seat of the break.

To make a sling, a *pièce* of strong cotton cloth one yard square should be cut diagonally from corner to corner, making two right-angled triangles. Each of these will make a properly shaped piece for a sling (*see* Figs. 9, 10 and 11).

To apply the sling place it in the position seen in Fig. 9, carrying the end 2 up in front of the forearm and over the right shoulder, while the end 1 is brought over the left shoulder and the two ends are tied together behind the neck. Then the end 3 is brought over the point of the elbow and pinned, as shown in Fig. 11. To fix the arm more firmly to the side it is well to apply a bandage snugly around the outside of the right arm and body, as seen in

Fig. 11. The dressing is kept in place for from 2 to 3 weeks and then the arm should be carried in a sling outside the clothes.

Fracture of the collar bone happens very often in little children, and is commonly only a partial break or splitting of the bone, not extending wholly through the shaft so as to divide it into two fragments, but causing little more than bending of the bone (the "green stick fracture").

A fall from a chair or bed is sufficient to cause the accident. A child generally cries out on movement of the arm of the injured side, or on being lifted by placing the hands under the armpits of the patient. A tender swelling is seen at the point of the injury of the collar bone. A broad cotton band, with straps over the shoulders to keep it up, should encircle the body and upper arm of the injured side, and the hand of the same side should be supported by a narrow sling fastened above behind the neck.

#### LOWER JAW FRACTURE

Fracture of the lower jaw is caused by a direct blow. It involves that part of the jaw occupied by the lower teeth, and is more apt to occur in the middle line in front or a short distance to one side of this point. The force causing the break usually not only breaks the bone, but also tears the gum through into the mouth, making a compound fracture.

**Symptoms.**—There is immediate swelling of the gum at the point of injury, and bleeding. The mouth can be opened with difficulty. The patient cannot talk plainly, and saliva and blood often drip from the mouth.

The condition of the teeth is the most important point to observe. Owing to displacement of the fragments there is a difference in the level of the teeth or line of the teeth, or both, at the place where the fracture occurs. Also one or more of the teeth are usually loosened at this point. In addition, unusual movement of the fragments may be detected, as well as a grating sound on manipulation.

**Treatment.**—The broken fragments should be pressed into place with the fingers, and retained temporarily with a four-tailed bandage as shown in Fig. 12. This consists of a piece of unbleached cotton

cloth four inches wide and one and one-half yards long. It is torn into two tails, leaving a strip (five inches long) in the middle intact.

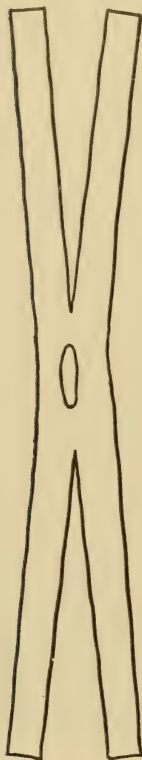


FIG. 12.—FOUR-TAILED BANDAGE FOR FRACTURE OF THE LOWER JAW.

The central part of the bandage is placed in front and under the chin. The two lower tails are then carried up and over the head and there tied; the two upper tails are brought behind the neck and there tied (*see* Fig. 13).

Feeding is done through a glass tube, using milk, broths, and thin gruels. A mouthwash should be employed four times daily, to keep the mouth clean and assist in healing the gum. A convenient preparation consists of menthol, one-half grain; thymol, one-half grain; boric acid, twenty grains; water, eight ounces.

The jaw is kept permanently in proper position by the dental surgeon who fits a rubber splint over the whole set of teeth in the lower jaw and



FIG. 13.—TREATMENT OF FRACTURE OF THE JAW BY MEANS OF A FOUR-TAILED BANDAGE.

fastens this to a tin splint molded to the outside of the jaw.

### FRACTURE OF THE NOSE

This may mean a break of the nasal bones; these are two in number. Together they form the upper half of the nose. Or the cartilage which forms the lower half of the nose may be separated from the nasal bones. In fractures of much severity the cartilage which divides the two nasal chambers inside the nose may be broken and variously distorted.



**Symptoms.**—The nose is commonly bent to one side or flattened on the face. The swelling may be so great at first that the deformity is obscured and not noticed. By very gentle manipulation it may be possible to feel the grating of the broken fragments, if the nasal bones are fractured. If the deformity is great there is unquestionably a fracture.

**Treatment.**—The restoring of the nose to normal shape is often a difficult or impossible task. There are all sorts of ingenious appliances for this purpose, none of which is wholly satisfactory.

The services of a surgeon should always be obtained, if possible. It will often be necessary for him to etherize the patient in order to restore the internal anatomy of the septum.

The simplest treatment is that of Davis whereby one presses externally the bones into place as well as possible and then attempts to hold them there by a small roll of bandage on either side of the nose, secured by strips of adhesive plaster as in Fig. 14. The nose should be cleaned inside twice daily by the use of the Birmingham douche, or gentle syringing, with a Seiler's tablet (or as much boric acid as will dissolve) in a glass of warm water. If the bleeding is serious it may be necessary to pack the nose (*see* Nosebleed).

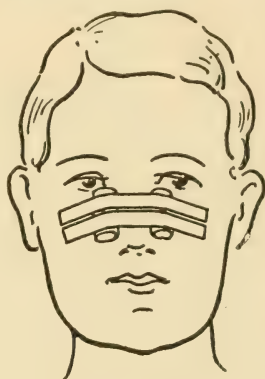


FIG. 14.—FRACTURE OF THE NOSE DRESSED WITH TWO SMALL BANDAGES AND ADHESIVE STRIPS.

#### SHOULDER-BLADE FRACTURE

**Symptoms.**—Fracture of the main body of the shoulder-blade occasions pain, swelling, and tenderness on pressure over the point of injury. On manipulating the bone a grating sound may be heard and movement between the fragments may be felt.

**Treatment.**—The treatment consists in binding the arm to the body by encircling the body and arm of the injured side (with clothes removed) with a wide bandage extending from shoulder to elbow, as for fracture of the arm. This bandage is prevented from

slipping by straps attached to it back and front and carried over each shoulder. Then the forearm is carried in a sling as described for broken collar bone.

If adhesive plaster is obtainable it is well to first support the shoulder blade by overlapping strips of adhesive plaster, as recommended for broken rib. The plaster should begin at the spine and cover the whole shoulder blade and also the outer part of the arm on the injured side. Then the bandage about the arm and body and sling are applied as just advised.

#### ARM FRACTURE

**Symptoms.**—In fracture of the arm (humerus) between the shoulder and elbow, swelling and shortening may give rise to deformity. Pain and abnormal motion are symptoms, while a grating sound may be detected, but only the gentlest manipulation of the arm for this purpose should be attempted. The surface is apt to become black and blue, owing to rupture of the blood vessels beneath the skin. Measuring the length of both arms, from a fixed bony point on each shoulder to the same bony point on the outside of each elbow, will show whether there is shortening of the injured arm.

**Treatment.**—The hand and forearm should be bandaged from below upward to the elbow. The bone is put in place by grasping the patient's elbow and pulling directly down in line with the arm, which is held slightly away from the side of the patient, while an assistant steadies and pulls up the shoulder. Then a wedge-shaped pad, long enough to reach from the patient's armpit to his elbow (made of cotton wadding or blanketing sewed in a cotton case) about four inches wide and three inches thick at one end, tapering up to a point at the other, is placed against the patient's side with the tapering end uppermost in the armpit and the thick end down. This pad is kept in place by a strip of surgeon's adhesive plaster, or bandage passing through the small end of the wedge, and brought up and fastened over the opposite shoulder.

While the arm is pulled down from the shoulder, three strips of well-padded tin or thin board (such as pictureframe backing

or thin box boards) two inches wide and long enough to reach from shoulder to elbow, are laid against the bare skin of the front, outside, and back of the arm, and secured by encircling strips of surgeon's plaster or bandage. The arm is then brought onto the pad lying against the side under the armpit, and is held there firmly by a wide bandage surrounding the arm and entire chest, and reaching from the shoulder to elbow. It is prevented from slipping by strips of cotton cloth, which are placed over the shoulders and pinned



FIG. 15.



FIG. 16.

FIGS. 15 AND 16.—TREATMENT OF FRACTURE OF BONE OF ARM. In Fig. 15, note Splints secured by Adhesive Plaster; also Pad in Armpit. In Fig. 16, see Wide Bandage around Body, also Sling.

behind and before to the top of the bandage. The wrist is then supported in a sling, not over two inches wide, with the forearm carried in a horizontal position across the front of the body. Firm union of the broken arm takes place usually in from four to six weeks (*see* Figs. 15 and 16).

A first-aid dressing for a break in the middle of the bone of the arm may be made by placing the splints as just described over the clothing of the arm, held in place by strips of adhesive plaster or bandages, and slinging the hand, as before.

A first-aid dressing for a break in the upper part of the bone

may be made by folding a towel for a pad in the armpit, holding the arm to the side with a bandage about the arm and body, and slinging the hand.

Fractures of the arm near the shoulder joint are not uncommon and are often mistaken, even by doctors, for dislocations. There is pain and inability to use the arm, often discoloration, but there may or may not be unnatural movement and grating of the fragments at the point of the break. It is always advisable to solve the diagnosis by the x-ray in this and all other fractures.

#### FRACTURES OF THE ELBOW

Fractures into a joint are apt to result in stiffness and uselessness of the joint so that these require surgical aid at the earliest possible moment. A temporary dressing for a break about the elbow joint consists of the same advised for treatment of a fractured collar bone, i. e., a wide sling for the forearm and elbow with a bandage holding the arm of the injured side to the body. (Fig. 11.)

#### FOREARM FRACTURES

Two bones enter into the structure of the forearm. One or both of these may be broken. The fracture may be simple or compound, when the soft parts are damaged and the break of the bone communicates with the air, the ends of the bone even projecting through the skin.

**Symptoms.**—In fracture of both bones there is marked deformity, caused by displacement of the broken fragments, and unusual motion may be discovered; a grating sound may also be detected, but any but the most gentle manipulation of the arm should be avoided.

When only one bone is broken the signs are not so marked, there is little deformity, but inability to use the forearm and, on examination, there is usually a very tender point at the seat of the fracture, and an irregularity of the surface of the bone may be felt at this point. If a point of false motion and a grating sound can also be elicited, the condition is clear.

**Treatment.**—The broken bones are put into their proper place



by the operator, who pulls steadily on the wrist, while an assistant grasps the upper part of the forearm and pulls the other way. The ends of the fragments are at the same time pressed into place by the other hand of the operator, so that the proper straight line of the limb is restored.

After the forearm is set, it should be held steadily in the following position while the splints are applied. The elbow is bent

so that the forearm is held horizontally across the front of the chest at right angles with the arm, with the hand extended—open palm toward the body and thumb uppermost. The splints, two in number, are made of wood about one-quarter of an inch thick, and one-quarter inch wider than the forearm (thin box boards are excellent). They should be long enough to reach from about two inches below the elbow to the root of the fingers. They are covered smoothly with cotton wadding, cotton wool, folded pillow case or towels, and then with a bandage. The splints are applied to the forearm in the positions described, one to the back of the hand and forearm, and the other to the palm of the hand and front of the forearm.



FIG. 17.—TREATMENT OF FRACTURE IN FOREARM.

Usually there are spaces in the palm of the hand and front of the wrist requiring to be filled with extra padding in addition to that on the splint. The splints are bound together and to the forearm by three strips of surgeon's adhesive plaster or bandage about two inches wide. One strip is wound about the upper ends of the splints, one is wrapped about them above the wrist, and the third surrounds the back of the hand and palm, binding the splints to-

gether below the thumb. The splints should be held firmly in place, but great care should be exercised to use no more force in applying the adhesive plaster or bandage than is necessary to accomplish this end, as it is easy to stop the circulation by pressure in this part. There should be some spring felt when the splints are pressed together after their application. A bandage is to be applied over the splints and strips of plaster, beginning at the wrist and covering the forearm to the elbow, using the same care not to put the bandage on too firmly. The forearm is then to be held in the same position by a wide sling, as shown in Fig. 17.

Four weeks are required to secure firm union after this fracture.

When the fracture is compound the same treatment should be employed as described under Compound Fractures.

### FRACTURE OF THE WRIST

#### (Colles' Fracture)

This is a break of the lower end of the bone on the thumb side of the wrist, and much the larger bone in this part of the forearm.



FIG. 18.—FRACTURE OF THE WRIST.

The accident happens when a person falls and strikes on the palm of the hand; it is more common in elderly people. A peculiar disfigure-

ment, known as silver fork deformity, results.

**Symptoms.**—A hump or swelling appears on the back of the wrist, and a deep crease is seen just above the hand in front (Fig. 18). The whole hand is also displaced at the wrist toward the thumb side. One is not usually able to detect abnormal motion in the case of this fracture, or to hear any grating sound on manipulating the part, as the ends of the fragments are generally so jammed together that it is necessary to secure a surgeon as soon as possible to pull them apart under ether, in order to remedy the existing "silver-fork" deformity (*see* Fig. 18).

**Treatment.**—Until medical aid can be obtained the same sort

of splints should be applied, and in the same way as for the treatment of fractured forearm. If the deformity is not relieved a stiff and painful joint usually persists. It is sometimes impossible for the most skillful surgeon entirely to correct the existing deformity, and in elderly people some stiffness and pain in the wrist and fingers are often unavoidable results.

#### FRACTURE OF BONE OF HAND OR FINGER

Fracture of the hand is due to a blow on the knuckles.

**Symptoms.**—This accident more commonly happens to the bones corresponding to the middle and ring finger, and occurs between the knuckle and the wrist, appearing as a swelling on the back of the hand. On looking at the closed fist from behind it will be seen that the knuckle corresponding to the broken bone in the back of

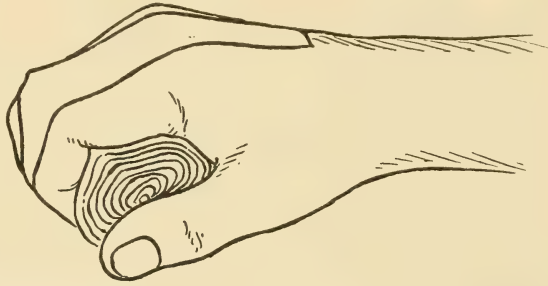


FIG. 19.—BREAK OF THE BONE IN THE BACK OF THE HAND CORRESPONDING TO RIGHT MIDDLE FINGER.

the hand has ceased to be prominent, and has sunken down below the level of its fellows. The end of the fragment nearer the wrist can generally be felt projecting up in the back of the hand, while the end of the lower fragment is sometimes felt in the palm.

**Treatment.**—If the finger corresponding to the broken bone in the back of the hand be pulled on forcibly, and the fragments be held between the thumb and forefinger of the other hand of the operator, pain and abnormal motion may be well detected, and the ends of the broken bone may be pressed into place. A thin wooden splint, as a piece of cigar box, about two inches wide at base and tapering to the width of the finger should be applied to the forearm and palm of the hand over the point of fracture. When there is not much displacement of the fragments of broken bone in the hand, or when either end of the broken bone projects toward the palm of the hand, a firm roll of bandage, large enough to be comfortably held in the hand, may be used as a splint. This is

placed in the open palm of the injured hand and then each finger and knuckle is drawn firmly down over it, and the closed hand is held in place over the bandage by a broad strip of adhesive plaster, as in Fig. 19, or by a cotton bandage. Three weeks are required for a firm union; the hand should not be touched for a month.

### BROKEN FINGER

**Symptoms.**—It is usually easy to recognize a broken bone in a finger, unless the break is near a joint, when it may be mistaken for a dislocation. Pain, abnormal motion, and grating between the fragments are observed.

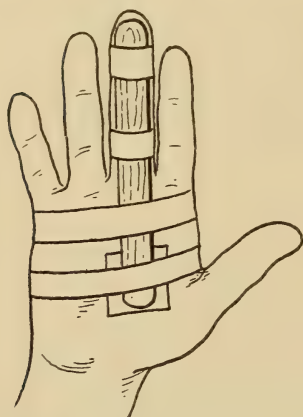


FIG. 20.—FRACTURE OF THE FINGER. Wooden Splint Applied on Palm Side.

**Treatment.**—If there is deformity, it may be corrected by pulling on the injured finger with one hand, while with the other the fragments are pressed into line. A narrow, padded wooden (half the thickness of a cigar box cover) or tin splint is applied, as in Fig. 20, reaching from the middle of the palm to the finger tip. Any existing displacement of the

broken bone can be relieved by using pressure with little pads of cotton held in place by narrow strips of adhesive plaster where it is needed to keep the bone in line. The splint may be removed in two weeks and a strip of adhesive plaster wound about the finger to support it for a week or two more.

In fracture of the thumb, the splint is often applied along the back instead of on the palm side.

### HIP FRACTURE

A fracture of the hip is really a break of that portion of the thigh bone which enters into the socket of the pelvic bone and forms the hip joint. It occurs most commonly in aged people as a result of so slight an accident as tripping on a rug, falling on the floor from the standing position, making a misstep, or even attempting to avoid a fall.



**Symptoms.**—When the accident has occurred the patient is unable to rise or walk, and suffers pain in the hip joint. When he has been helped to bed it will be seen that the foot on the injured side is turned out, and the leg is perhaps shorter than its fellow. The patient cannot raise the heel of the injured leg from the bed. Shortening is an important sign. The shortening may be one-half an inch or so at first, but may increase to two inches within a few days. Shortening less than one-half inch is of no consequence as a sign of fracture.

With a patient lying flat on his back and both legs straight together in a line with his body, measurements are made with a tape or string to the bony prominence on the inside of each ankle. One end of the tape is held at the navel and the other swung from one ankle to the other, comparing the length of the two limbs. When the bony prominences on the inside of the two ankles can be brought together, shortening of one leg may be patent to the eye. If the broken leg cannot be brought into a straight line with the body, then the sound limb should be placed in the same position as the injured leg when the measurements are made.

The fragments of broken bone are often jammed together (impacted) so that it is impossible to get any sound of grating between them, and it is very unwise to manipulate the leg or hip joint, except in the gentlest manner, in an attempt to get this grating. If the ends of the fragments become disengaged from each other, it often happens that union of the break never occurs.

If, after even a slight injury, an old person is unable to use one leg, a fracture of the hip should be strongly suspected, even if no sign of a fracture is discoverable. The x-ray will then solve the diagnosis.

**Treatment.**—The treatment simply consists in keeping the patient quiet on a hard mattress, with a small pillow under the knee of the injured side and the limb steadied on either side by pillows or cushions until a surgeon can be obtained. If the patient with fractured hip must be transported, then the leg should be supported by splints as recommended for fracture of the shaft of the thigh bone (*see* Fig. 21).

**THIGH BONE FRACTURE**

**Symptoms.**—In fracture of the shaft of the thigh bone (between the hip and knee), there is often great swelling about the break. The limb is helpless and useless. There is intense pain and abnormal position in the injured part, besides deformity produced by the swelling. The foot of the injured limb is turned out or in, owing to a rolling over of the portion of the limb below the break. With both lower limbs in line with the body, and the patient lying on the back, measurements are made with a tape-measure or string from the navel to the prominence on the inside of either ankle joint. Shortening of the injured leg will be found, varying from one to over two inches, according to the overlapping and displacement of the fragments.

**Treatment.**—To set this fracture temporarily, a board about five inches wide, and long enough to reach from the armpit to the foot, should be padded well with towels, sheets, shawls, coats, blanket or whatever is at hand; the padding can best be kept in place by surgeon's adhesive plaster, bicycle tape, or strips of cloth. A bed slat or fence paling will do. Another splint should be provided as wide as the thigh and long enough to reach along the back of the leg from the middle of the calf to the buttock, and also padded in the same way. A third splint should be prepared in the same manner to go inside the leg, reaching from the crotch to the inside of the foot. Still a fourth splint made of thin (one-fourth inch) board as wide as the thigh, extending from the upper part of the thigh to just above the knee, should be padded for application to the front of the thigh.

When these are ready and at hand, the leg should be pulled on steadily but carefully, straight away from the body to relax the muscle, an assistant holding the upper part of the thigh and pulling in the opposite direction. Then, when the leg has been straightened out and the thigh bone seems in fair line, the splints should be applied; the first to the outside of the thigh and body; the second under the calf, knee, and thigh; the third to the inside of the whole limb; and the fourth to the front of the thigh.

Wide pads of folded sheet should be placed over the ribs under the outside splints to fill the space above the hips and under the armpit. Then all four splints should be drawn together and held in place by adhesive plaster straps or strips of strong muslin applied as follows: one above the ankle; one below the knee; one above the knee; one in the middle of the thigh; and one around the upper part of the thigh. A wide band of strong muslin or sheeting should then be bound around the whole body between the armpits and hips, inclosing the upper part of the outside splint.

Following this, the patient can then be borne comfortably upon a stretcher made of boards and a mattress or some improvised cushion (*see Fig. 21*).



FIG. 21.—SPLINTS USED IN TRANSPORTATION IN CASE OF FRACTURE OF SHAFT OF THIGH.

When the patient can immediately be put to bed after the injury, and does not have to be transported, it is only necessary to apply the outer, back and front splints, omitting the inner splint. In emergencies where only one splint is obtainable the outer is the important one. It should be attached to the leg and body as described above and shown in Fig. 21. The foot should also be bandaged to the splint to prevent it from rolling out or in. The bandages binding the splint to the leg and body may be slipped under the patient without lifting either his body or limb.

It is necessary for the proper and permanent setting of a fractured thigh that a surgeon give an anesthetic and apply the splints while the muscles are completely relaxed. It is also very essential that the muscles be kept from contracting thereafter by hanging a fifteen or twenty-pound weight to the injured leg, after the splints are applied. It is only possible to outline here the proper first-aid treatment.



**KNEEPAN FRACTURE**

Fracture of the kneepan is caused either by direct violence or muscular strain, as in trying to recover one's balance after tripping or slipping. It more frequently occurs in young adults.

**Symptoms.**—Immediate pain is felt in the knee and walking becomes impossible; in fact, often the patient cannot rise from the ground after the accident. He may, however, be able to stand after being assisted to his feet, but can only move backward by dragging the foot of the injured leg along the ground. Swelling at first is slight but increases enormously within a few hours, and it may be impossible then to recognize the existence of fracture until the swelling subsides. Immediately after the injury, however, it may be possible to feel the separate broken fragments of the kneepan and to recognize that they are separated by a considerable space, if the break is horizontal across the bone.

**Treatment.**—Nothing can be done to set the fracture until the swelling about the joint has been reduced; so that the first treatment consists in securing immediate rest for the kneejoint, and immobility of the fragments. A splint made of board, about a quarter of an inch thick and about four inches wide for an adult, reaching from the upper part of the thigh above, to a little above the ankle below, is applied to the back of the limb and well padded with a folded sheet, extra layers being placed beneath the first to fill the space behind the knee. The splint is attached to the limb by straps of adhesive plaster two and one-half inches wide: one around the lower end of the splint, one around the upper part, and the third, just below the knee. To prevent and arrest the swelling and pain, pressure is then made on the knee by bandaging.

One of the best methods (Scudder's) is to bandage two large, flat, dry sponges over the knee, one on each side, and pour cold water over them. They swell, exert firm and even pressure and prevent swelling of the joint. After twelve hours new sponges should be employed (the first set may be dried and pressed flat for use again) or a rubber bandage may be applied over the knee and then an icebag. But a splint is the first requisite in any case.



The patient should of course be put to bed as soon as possible after the accident, and should lie on his back with the injured leg elevated on a pillow with a cradle to keep the clothes from pressing on the injured limb.

#### FRACTURE OF LEG BONES BETWEEN KNEE AND ANKLE

**Symptoms.**—In fracture of the leg between the knee and ankle we have pain, angular deformity or an apparent false joint in the leg, swelling and tenderness over the seat of fracture, together with inability to use the injured leg. Two bones form the framework of the leg; the inner, or shinbone, the sharp edge of which can be felt in front throughout most of its course, being much the larger and stronger bone. When both bones are broken the displacement of the fragments, abnormal motion and consequent deformity are commonly apparent, and a grating sound may be heard.

An open wound often communicates with the break, making the fracture compound—a much more serious condition. To avoid making the fracture a compound one, during examination of the leg, owing to the sharp ends of the bony fragments, the utmost gentleness should be used. Under no circumstances should an attempt be made to move the fragments from side to side or backward and forward, in an effort to detect the grating sound often caused by the ends of broken bones. The greatest danger lies in the desire to do too much.

When one bone is broken there may be only a point of tenderness and swelling about the vicinity of the break and no displacement or grating sound. When in doubt as to the existence of a fracture the limb should always be treated as if a fracture were present. “Black-and-blue” discoloration of the skin, much more extensive than that following sprain, will become evident over the whole leg within twenty-four hours.

**Treatment.**—When a surgeon cannot be obtained, the following temporary pillow dressing, recommended by Scudder in his book on fractures, is one of the best. With the patient on his back—the leg having been straightened and any deformity removed as far as possible by grasping the foot and pulling directly away from

the body while an assistant steadies the thigh—a large, soft pillow, inclosed in a pillow case should be placed under the leg and pinned together along the front of the latter. The open end of the pillow case is folded and pinned over the sole of the foot.

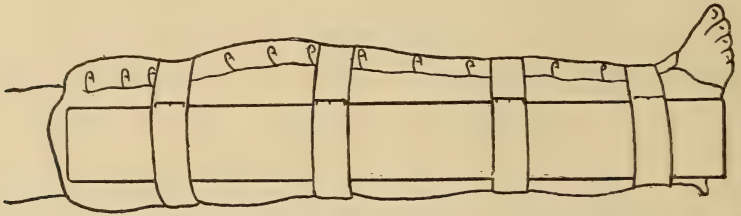


FIG. 22.—FIRST AID TREATMENT OF FRACTURE OF BOTH BONES.

Then three strips of wood about four inches wide, three-sixteenths to one-quarter of an inch thick, and long enough to reach from the sole of the foot to about four inches above the knee, are placed outside of the pillow along the inner and outer aspects of the leg and beneath it. The splints are held in place, with the pillow as padding beneath, by four leather straps (or if these can-

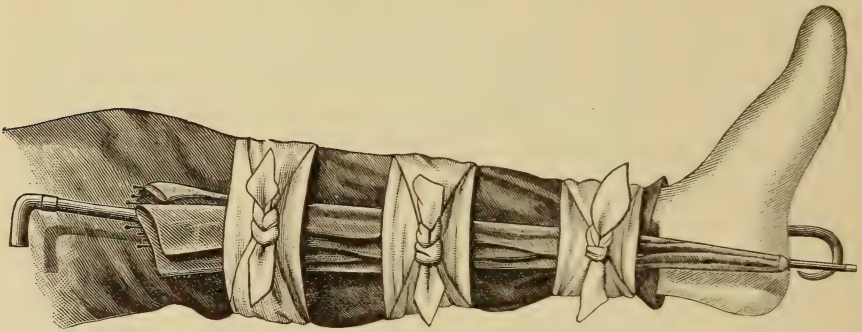


FIG. 23.—UMBRELLA USED AS TEMPORARY SPLINT IN FRACTURE OF THE LEG. (After Doty's "Prompt Aid to the Injured.")

not be obtained, by strips of bandage, stout cloth, adhesive plaster, or even rope); and four pads made of folded towels should be put under the straps where they cross the front of the leg, at which place little but the pillow case overlaps. These straps are applied thus: one above the knee, one above the ankle, and the other two between these two points, holding all firmly together. This dress-

ing may be left undisturbed for a week if necessary. The leg should be kept elevated after the splints are applied, and steadied by pillows placed on either side of it (*see* Fig. 22).

From one to two months are required to secure union in a broken leg in adults, and from three to five months elapse before the limb is completely serviceable. In children the time requisite for a cure is usually much shorter. In Fig. 23 is shown a method of first-aid, temporary care of a fracture of the leg in order to remove a patient to a surgeon for proper treatment. It is a poor method compared to that described.

#### ANKLE JOINT FRACTURE

A fracture of the ankle joint is really a fracture of the lower extremities of the bones of the leg.

**Symptoms.**—There are present pain and great swelling, particularly on the inner side of the ankle at first, and the whole foot is pushed and bent outward. The bony prominence on the inner side of the ankle is unduly marked. The foot, besides being bent outward, is also displaced backward on the leg. This fracture might be taken for a dislocation or sprain of the ankle. Dislocation of the ankle without fracture is very rare, and when the foot is returned to its proper position, it will stay there, while in fracture the foot drops back to its former displaced state. In sprained ankle there are pain and swelling, but not the deformity caused by the displacement of the foot.

**Treatment.**—This fracture may be treated temporarily by returning the foot to its usual position and putting on side splints and a back splint, as described for the treatment of fracture of the leg.

#### FRACTURE OF THE BONES OF THE FOOT

Fracture of the bones in front of the instep, corresponding to those of the palm of the hand, is caused by crushing violence. The bones (metatarsal—of which there are five) most likely to be broken are the inner and outer ones connecting with the big or little toe.

**Symptoms.**—There is a painful and swollen area on the foot and abnormal movement and grating may be felt between the broken



fragments. The deformity is slight, but the patient cannot bear his weight on the foot.

**Treatment.**—The patient must keep his foot upon a chair, bed, or sofa. The broken bones should be pressed in place and kept there by a splint made of moistened heavy pasteboard or heavy felt, molded to one side of the leg and foot—reaching from the middle of the calf to the tips of the toes—on the injured side. This is kept in place by a bandage. The foot is held at right angles with the leg. If there is an open wound in connection with the fracture the case is much more serious and demands the immediate care of a surgeon (*see* Compound Fractures).

Fracture of the toes is not common except from a crush of the foot. A large, thin, padded, tin splint, covering the whole sole of the foot and undersurface of the broken toe, is held in place by adhesive plaster strips and bandage. Union occurs in three or four weeks.

#### COMPOUND OR OPEN FRACTURE OF THE LEG

A fracture, connecting with an external wound, is said to be compound. The broken bone may or may not project through the external wound. The wound may be produced either by the same violence which caused the fracture, or by the end of a bony fragment piercing the muscles and skin from within. In either event the result is much more serious than that of an ordinary simple fracture, for germs can gain entrance through the wound in the skin and cause inflammation with partial destruction or death of the part.

**Treatment.**—Immediate treatment is here of the utmost value—the usefulness of the limb and the life of the patient depends upon it. This is applicable to open or compound fracture of any part of the body.

The clothing should be carefully cut away from the limb. As a first-aid treatment the use of iodine is as valuable as the prolonged washing described below, and much simpler. After exposing the wound, remove bits of clothing or other dirt in it by means of forceps or hat pin (previously boiled five minutes), being sure not to touch the wound or its borders with the fingers. If there is much



bleeding this must be controlled by tying a bandage tightly around the leg above the knee—to remain until the patient is placed in bed with the foot raised. Pour a little iodine (half alcohol and half tincture of iodine) into the wound so that it will come in contact with every part of it. Then swab the skin for an area two inches wide about the wound with the same mixture. This may be done with a piece of absorbent cotton wound on a stick. If a fragment of bone projects from the wound this should be thoroughly covered with iodine, and restored to place, as advised below. A strip of sterile gauze should also be thrust down into the wound to afford drainage, and this should be removed in three days.

If the wound is small or if a surgeon can be obtained within a day or so this need not be done. Then a thick pad of dry, sterile gauze covered by absorbent cotton, the whole at least two inches thick, should be laid on the wound and bandaged to the leg. When no sterile gauze is to be had one may place several layers of cotton cloth (previously boiled five minutes) over the wound by means of a pair of forceps or two ordinary forks (previously boiled), the object being not to touch the dressing or the wound with the hands. A dry dressing is, however, preferable as water on top of iodine on the skin causes some irritation. No shaving or washing is thus required when iodine is used. When iodine is not at hand the following procedure is to be employed.

The area for a considerable distance about the wound, if covered with hair, should be shaved. It should next be washed with warm water and soap by means of a clean piece of cotton cloth or absorbent cotton, protecting the wound meanwhile from any soiling by covering it, temporarily, with a pad of sterile gauze or boiled absorbent cotton. Then some absorbent cotton or cotton cloth should be boiled in water in a clean vessel for a few minutes, and, after the operator has thoroughly washed his hands, the boiled water (when sufficiently cool) should be applied to the wounded area and surrounding parts with the boiled cotton, removing in the most painstaking way all visible **and** invisible dirt. By allowing some of the water to flow over the wound from the height of a few feet this result is favored. Finally some of the boiled cotton, which

has not been previously touched, is spread over the wound wet, and covered with clean, dry, absorbent cotton, and bandaged.

Splints are then applied, as for simple fracture, in the same locality. If a fragment of bone projects through the wound it may be replaced, after the cleansing just described, by grasping the lower part of the limb and pulling it in a straight line away from the body, while an assistant holds firmly the upper part of the limb and pulls in the opposite direction. During the whole process neither the hands of the operator nor the boiled cotton should come in contact with anything except the vessel containing the boiled water and the wound.

The insertion of a strip of gauze for drainage is necessary, as described above, unless the case can be seen by a surgeon within twenty-four hours. The future treatment of the case is exactly similar to that of wounds generally. The first dressing need not be disturbed at all for a week or more, unless there is fever, or the dressing becomes soaked through with discharge, or a gauze strip has been inserted for drainage and which must be removed. If there is then no pus in the wound, it should be covered with dry, sterile gauze and not disturbed for a week more, unless fever appears.

## CHAPTER V

### DISLOCATIONS

Dislocations of the jaw, shoulder, elbow, hip, thumb, and fingers.

A dislocation is an injury to a joint wherein the ends of the bones forming a joint are forced out of place. A dislocation is commonly described as a condition in which a part (as the shoulder) is "out of joint" or "out of place."

**Dislocation as Distinguished from Sprain and Fracture Near a Joint.**—A dislocation must be distinguished from a sprain, and from a fracture near a joint. In a sprain, as has been stated, the bones entering into the formation of the joint are perhaps momentarily displaced, but return into their proper place when the violence is removed. But, owing to greater injury in dislocation, the head of the bone slips out of the socket which should hold it, breaks through the ligament (capsule) surrounding the joint, and remains permanently out of place; for this reason there is a peculiar deformity, produced by the head of the bone's lying in its new and unnatural situation, which is not seen in a sprain.

Also the dislocated joint cannot be moved by the patient or by another person, except within narrow limits, while a sprained joint can be moved, with the production of pain, it is true, but without any mechanical obstacle. In the case of fracture near a joint there is usually increased movement in some new direction. When a dislocated joint is put in proper place it stays in place, whereas when a fractured part is reduced there is nothing to keep it in place and, if left alone, it quickly resumes its former faulty position.

**Treatment.**—There is no necessity for hurry in the case of most dislocations, as they may be reduced within twenty-four hours with

as little danger as immediately after their occurrence. Of course the pain is relieved by their immediate treatment, this being imperative when a surgeon is at command. On the other hand injury to vessels and nerves of a permanent character (paralysis) is not uncommon when much violence is used to reduce a dislocation, especially by an unskilled person. The ideal method of treatment consists in giving ether to the patient, which immediately relaxes muscular spasm and allows of easy and painless reduction by the surgeon. This cannot be advised for the layman, however. When a surgeon can be obtained within a few days, and after a reasonable attempt has been used to reduce the dislocation, it is better to wait than to resort to persistent and violent efforts to get the bone into place.

Only a few of the more common dislocations will be considered here, as the others are of rare occurrence and require more skill than can be imparted in a book for the laity. The following instructions are not to be followed if skilled surgical attendance can be secured; they are intended solely for those not so fortunately situated.

## **SPECIAL DISLOCATIONS**

### **DISLOCATION OF THE JAW**

This condition is caused by a blow on the chin, or occurs in gaping, or when the mouth is kept widely open during prolonged dental operations and during anesthesia.

**Symptoms.**—The joint surface at the upper part of the lower jaw, just in front of the entrance to the ear, is thrown out of its socket on one side of the face, or on both sides. If the jaw is put out of place on both sides at once, the chin will be found projecting, so that the lower front teeth jut out beyond the upper front teeth, the mouth will be open and cannot be closed, and the patient will suffer considerable pain. When the jaw is dislocated on one side only, the chin is pushed over toward the uninjured side of the face, giving the face a twisted appearance; the mouth is partly open and fixed in that position; a depression is seen on the injured side in



front of the ear, while a corresponding prominence exists on the opposite side of the face; and the lower front teeth project beyond the upper front teeth.

**Treatment.**—This is usually one of the easiest dislocations to reduce or put into place. A dislocation of one side of the jaw is treated in the same manner as that of both sides.

The dislocation may sometimes be reduced, with the mouth opened to the widest extent, by placing a good-sized cork as far back as possible between the back teeth of the upper and lower jaws (on one or both sides according as the jaw is out of place on one or both sides), and getting the patient to bite down on the cork. This may pry the jaw back into place.

The common method is for the operator to protect both thumbs by wrapping bandage about them or wearing leather gloves, and then, while an assistant steadies the head, the operator presses downward and backward on the back teeth of the patient on each side of the lower jaw with both thumbs in the patient's mouth.

When the jaw slips into place it should be maintained there by a four-tailed bandage placed around the head and under the chin and retained there for a week (Fig. 13). During this time the patient should be fed on liquids through a tube, so that it will not be necessary for him to open his mouth to any extent. The surgeon will give the patient ether and will open the mouth wider, to stretch the ligaments on the sides of the jaws, and will then simply press the jaw gently backward and slightly downward with the thumbs on the outside of the jaw.

#### DISLOCATION OF THE SHOULDER

This is by far the most common of dislocations in adults, constituting over one-half of dislocations of all the other joints combined. It is caused by a fall or blow on the upper arm or shoulder, or by falling upon the elbow or outstretched hands. The upper part (or head) of the bone of the arm (humerus) slips downward out of the socket, or, in some cases, inward and forward. In either case the general appearance and treatment of the accident are the same.

**Symptoms.**—The patient sits with his body bent toward the injured side, holding the forearm with the hand of the sound side. The shoulder of the injured side loses its fullness and looks flatter in front and on the side, the point of the shoulder being more prominent. If the arm is held with the elbow a few inches away from the side, the line of the arm will slope inwardly toward the shoulder, as compared with the sound arm. The elbow of the injured arm cannot be readily brought to the side of the chest. The injured arm cannot be moved much by the patient, although it can be lifted up and away from the side by another person, but cannot be moved so that the hand of the injured arm can be laid on the opposite shoulder.

**Treatment.**—If a patient can be seen by a surgeon within a day or two, it is wiser to put the arm in a sling and bind the arm to the side with a large pad in the armpit, as in fracture of the collar bone, until the doctor can manage the case. Sometimes, however, gently pulling of the arm—as described below—will allow the bone to instantly fall into place with the greatest relief.

As fractures about the upper part of the arm bone (humerus) are often mistaken for dislocations, it is always wiser to have an x-ray picture of the joint taken after a severe injury, especially if relief is not immediate when the supposed dislocation is reduced.

One of the simplest methods (Stimson's) of reducing this dislocation consists of placing the patient on his injured side on a canvas cot, which should be raised high enough from the floor on chairs, and allowing the injured arm to hang directly downward toward the floor through a hole in the cot, the hand not touching the floor. Then a ten-pound weight should be attached to the wrist. The gradual pull produced by this means generally brings the shoulder back into place without pain, and within six minutes.

Another simple method of reducing a dislocation of the shoulder is the following: With the patient on his back, the arm should be brought to a right angle with the body and pulled with considerable steady force directly away from the shoulder, while an assistant should press the head, or upper part of the bone, up into the armpit. A third person, if available, should steady the body

by means of a folded sheet passed about the chest, pulling on it away from the individual who is drawing out the injured arm. The bone will go back with a click which may be heard and felt, and the relief which the patient experiences is so sudden and great as to be almost painful.

The ordinary and more violent method consists in putting the patient on his back on the floor, the operator also sitting on the floor with his stockinged foot against the patient's side under the armpit of the injured shoulder and grasping the injured arm at the elbow. He then pulls the arm directly outward (i. e., with the arm at right angles to the body) and away from the trunk. An assistant may at the same time aid by lifting the head of the arm bone upwards with his fingers in the patient's armpit and his thumbs over the injured shoulder.

It is better to pull the arm away from the body as directed and, while pulling, bring the arm gradually to the side.

If the arm does not go into place easily by one of these methods it is unwise to continue making further attempts. Also, if the shoulder has been dislocated several days, or if the patient is very muscular, it will generally be necessary for a surgeon to give ether in order to reduce the dislocation. It is entirely possible for a skillful surgeon to secure reduction of a dislocation of the shoulder several weeks after its occurrence. After the dislocation has been relieved the arm, above the elbow, should be bandaged to the side of the chest and the hand of the injured side be carried in a sling for ten days, as in the treatment of fractured collar bone.

#### DISLOCATION OF THE ELBOW

This is more frequent in children, and is usually produced by a fall on the outstretched hand.

**Symptoms.**—The elbow is thrown out of joint, so that the forearm is displaced backward on the arm, in the more usual form of dislocation. The elbow joint is swollen and generally held slightly bent, but cannot be stretched out to any extent without great pain. The tip of the elbow projects at the back of the joint more than usual, leaving a gap between it and the back of the arm bone, while



at the front of the arm the distance between the wrist and the bend of the elbow is less than that of the sound arm.

For further proof that the elbow is out of joint we must compare the relations of three points in each elbow. These are the two bony prominences on either side of the joint (belonging to the bone of the arm above the elbow) and the bony prominence forming the tip of the elbow which belongs to the bone of the forearm.

In dislocation backward of the forearm, the tip of the elbow is observed to be farther back, in relation to the two bony promi-

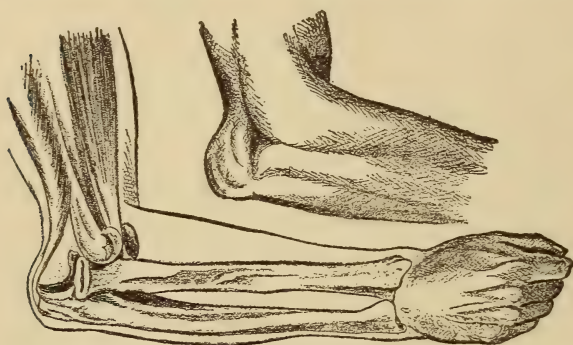


FIG. 24.—DISLOCATION BACKWARD OF BOTH BONES OF THE FOREARM, SHOWING POSITION OF THE ENDS OF THE DISLOCATED BONES, DEFORMITY OF ELBOW, AND POSITION OF FOREARM.

nences at the side of the joint, than is the case in the sound elbow.

This is best ascertained by touching the three points on the patient's elbow of each arm in turn.

with the thumb and middle finger, on each of

the prominences on the side of the joint, while the forefinger is placed on the tip of the elbow. The lower end of the bone of the upper arm is often seen and felt easily just above the bend of the elbow in front, as it is thrown forward (*see* Fig. 24).

Fracture of the lower part of the bone of the arm above the elbow joint may present much the same appearance as the dislocation we are describing, but then the whole elbow is displaced backward, and the relation of the three points described above is the same in the injured as in the uninjured arm. Moreover, in fracture, the deformity, when relieved, will immediately recur when the arm is released, as there is nothing to hold the bones in place; but in dislocation, after the bones are replaced in their normal position, the deformity will not reappear.

**Treatment.**—The treatment for dislocation consists in bending



the forearm backward, to a straight line, or even a little more, and then while an assistant firmly holds the arm above the elbow, the forearm should be grasped below the elbow and pulled with great force away from the assistant and, while exerting this traction, the elbow should suddenly be bent forward to a right angle, when the bones should slip into place, often with a loud snap.

The aftertreatment consists in binding the arm of the injured side to the chest and the use of a large sling, as recommended for treatment of broken collar bone. The sling should be removed after the second day and the elbow joint slightly moved by another person to prevent stiffness. This, with rubbing about the joint, should be done for five minutes each day and then the sling should be reapplied and continued for two or three weeks.

A dislocation of the elbow is often complicated with a fracture, so that a surgeon's services are always demanded and the aid of an x-ray picture is advisable.

#### DISLOCATION OF THE HIP

This occurs more commonly in males from fifteen to forty-five years of age, and is due to external violence.

**Symptoms.**—In the more ordinary form of hip dislocation (displacement backward of the head of the thigh bone from its socket) the patient stands on the sound leg with the body bent forward, the injured leg being greatly shortened, the toes turned inward so much that the foot of the injured limb crosses over the instep of the sound foot. When the patient lies down the knee of the injured limb rests on the thigh above the knee of the sound leg. The injured limb cannot be moved outward and but slightly inward, yet may be bent forward. Walking is impossible. Pain and deformity of the hip joint are evident.

The only condition with which this would be likely to be confused is a fracture of bone in the region of the hip. Fracture of the hip is common in old people, but not in youth or middle adult life. In fracture there is usually not enough shortening to be perceived with the eye; the toes are more often turned out, and the patient can often bear some weight on the limb, and even walk.

**Treatment.**—The most simple treatment is that recommended by Stimson, as follows: The patient should lie, face downward, upon a table with the uninjured leg held horizontally by one person, while another person (with the injured thigh hanging down vertically and leg at right angles) grasps the patient's ankle and gently rocks it from side to side—after placing a five to ten-pound sand bag, or other object of similar weight, on the bend of the knee. Dr. Stimson frequently uses no weight on the injured leg but relies on the weight of the thigh to pull the bone into place, when held in the described position with the muscles relaxed. He, however, often uses ether to secure complete relaxation. Stimson states that in only two instances has he failed to reduce this dislocation by this means. When the dislocation has been overcome the patient should rest in bed for a week or two and should then go about gradually on crutches for a term of two weeks longer.

#### DISLOCATION OF THE THUMB AND FINGERS

This accident is usually due to a bending of the thumb or fingers backward.

##### THE THUMB

In the case of the thumb, the separation and position of the dislocated bones (together with the deformity produced in the external appearance of the thumb) constitute a difficult dislocation to reduce, even under ether, and sometimes the surgeon is compelled to resort to a cutting operation.

**Treatment.**—The reduction is attempted by bending and at the same time pulling the thumb forcibly backward while the head of the bone is being pressed forward into its proper place.

A padded splint, reaching from the tip of the thumb to the wrist, should be applied to the palm side of the thumb and held in place by encircling strips of adhesive plaster. It should be retained for five days, when it may be removed, and slight movements and massage of the joints may be begun.

## FINGER JOINTS

**Treatment.**—Dislocation of the finger joints may be reduced by forcible pulling of the finger in a straight line away from the hand while twisting the bone slightly in one direction or another to aid the dislocated end to slip back into position. It is very much easier to accomplish a reduction at once than a few days later. The finger should be bandaged on a splint for five days, as for fracture, and then followed by massage, gentle movements, and soaking of the injured finger in hot water.

## CHAPTER VI

### SURGICAL DRESSINGS AND BANDAGES OF VARIOUS KINDS FOR DIFFERENT PARTS OF THE BODY

Surgical dressings. Bandages of the limbs, including T-bandage, figure-of-eight bandage, spica of foot, triangular bandage of foot. Bandages of the head, breast, and shoulder, including triangular bandage of the head, triangular bandage of the breast, cravat bandage of the jaw, cravat bandage of the eye, cravat bandage of the shoulder. Transportation of the injured.

### SURGICAL DRESSINGS

Sterilized gauze is the chief surgical dressing of the present day. This material is simply cheesecloth, from which grease and dirt have been removed by boiling in some alkalin preparation—usually washing soda—and rinsing in pure water. The gauze is sterilized by subjecting it to moist or dry heat. Sterilized gauze may be bought in quantities of one yard upwards at shops dealing in surgeons' supplies and instruments, and at most drug stores. Gauze or cheesecloth may be sterilized (to destroy germs) by baking in a slow oven in tin boxes, or wrapped in cotton cloth, until it begins to turn brown. It is well to have a small piece of the gauze in a separate package, which may be inspected from time to time in order to see how the baking is progressing, as the material to be employed for surgical purposes should not be opened until just before it is to be used, any remainder being immediately covered again. Cut the gauze into pieces as large as the hand, before it is sterilized, to avoid cutting and handling afterwards. Gauze may also be sterilized by steaming in an Arnold sterilizer, such as is used for milk, or by boiling ten minutes, if it is to be applied wet. Carbolized, borated, and corrosive sublimate gauze have little special value.



Absorbent cotton is also employed as a surgical dressing, and should also be sterilized if it is to be used on raw surfaces. It is not so useful for dressing wounds as gauze, since it mats down closely, does not absorb secretions and discharges so well, and sticks to the parts. When torn into balls as large as an egg and boiled for fifteen minutes in water, it is useful as sponges for cleaning wounds. Sheet wadding or cotton is serviceable in covering splints before they are applied to the skin.

Wet antiseptic surgical dressings are valuable in treating wounds which are inflamed and are not healing well. They are made by soaking gauze in compound creosol solution, one teaspoonful to the pint of water, or (1 to 3,000) corrosive sublimate solution, and after application, covering the gauze with oil silk, rubber or paraffin paper. Heavy brown wrapping paper, well oiled or greased, will answer the purpose when better material is not at hand.

## BANDAGES

Bandaging is an art that can only be acquired in any degree of perfection by practical instruction and experience. Some useful hints, however, may be given to the inexperienced.

Cotton cloth or muslin, bleached or unbleached, is commonly employed for bandages; also gauze (not so effective a dressing but much easier of application), which is softer and more comfortable, and is best adapted to the use of the novice. A bandage cannot be put on properly unless it is first rolled. A bandage for the limbs should be about two and one-half inches wide and eight yards long; for the fingers, three-quarters of an inch wide and three yards long. The bandage may be rolled on itself until it is as large as the finger and then rolled down the front of the thigh, with the palm of the right hand, while the loose end is held taut in the left hand.

Rolled gauze bandages, sterilized and wrapped separately in paper, are sold at all drug stores.

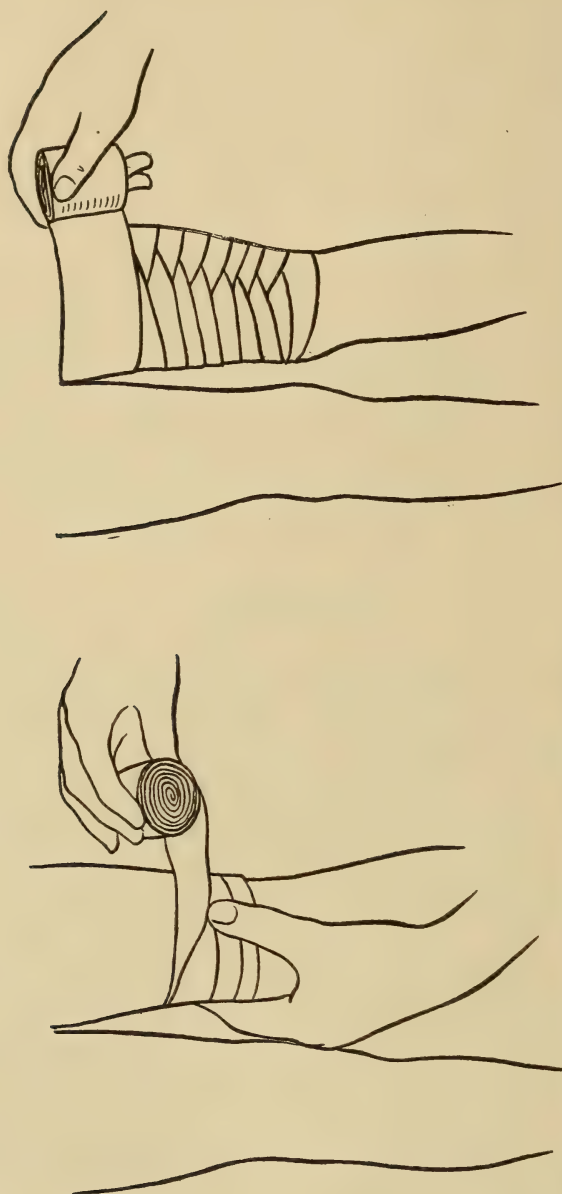


FIG. 26.—SPIRAL REVERSE BANDAGE OF THIGH COMPLETED.

FIG. 25.—SPIRAL REVERSE BANDAGE OF THIGH, SHOWING THE INTRODUCTION OF THE FIRST REVERSE.

## BANDAGES OF THE LIMBS

Two forms of bandages are adapted to the limbs, the figure-of-eight bandage, and the spiral reversed bandage. In applying a bandage always begin at the lower extremity of the limb and approach the body. Make a few circular turns about the limb, from left to right, with the bandage coming from the under part of the roll. The object of making several complete turns of the bandage, over the same circumference of the limb, is to lock and keep the free end from slipping. Then as the limb enlarges, draw the bandage up spirally, reversing it each time it encircles the limb, as shown in Figs. 25 and 26. In reversing, hold the bandage with the left thumb or forefinger so that it will not slip, and then allowing the free end to fall slack, turn down as in Figs. 25 and 26.

## T-BANDAGE

The T-bandage is used to bandage the crotch between the thighs, or around the forehead and over the top of the skull (*see* Fig. 27). In the former case the ends 1-1 are put about the body as a

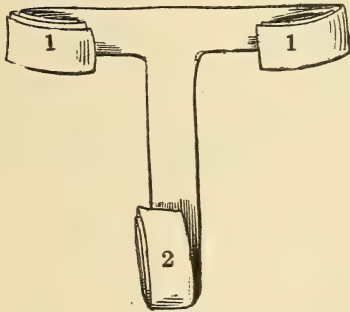


FIG. 27.—T-BANDAGE. (After Weeks-Shaw "Textbook of Nursing.")

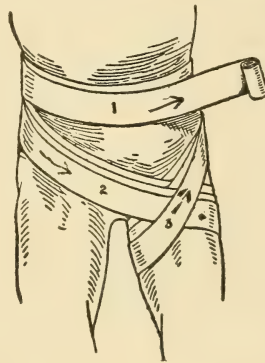


FIG. 28.—FIGURE-OF-EIGHT OR SPICA BANDAGE OF THE THIGH.

belt, and the end 2 is brought from behind, in the narrow part of the back, down forward between the thighs, over the crotch, and up to the belt in the lower part of the belly. The figure-of-eight bandage is used on various parts, and is illustrated in the bandage

called spica of the groin (Fig. 28). Beginning with a few circular turns about the body in the direction of 1, the bandage is brought down in front of the body and groin, as in 2, and then about the back of the thigh up around the front of the thigh, as in 3, across the back and once around the body and down again as in 2. The figure-of-eight of the neck and shoulder is applied in the same manner. Beginning by making a few complete circular turns about the neck, and coming from behind the neck down in front of the shoulder, under the armpit and back in front of the neck.

#### SPICA—FIGURE-OF-EIGHT BANDAGE

In the spica, or figure-of-eight of the shoulder, Fig. 29, four complete circular turns of the bandage are made at 1 around the

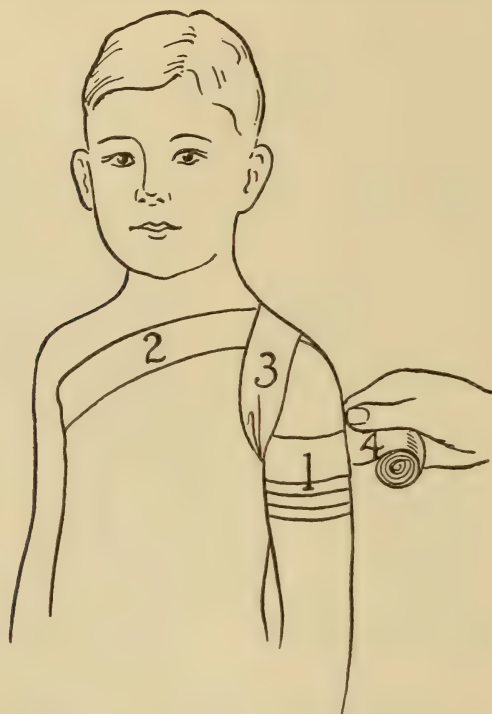


FIG. 29.—FIGURE-OF-EIGHT OR SPICA BANDAGE OF THE SHOULDER.

arm, and the bandage is then passed over the shoulder and across the front of the chest at 2, under the opposite armpit, returning across



the back and down over the front of the shoulder at 3, round under the arm again at 4.

### SPICA OF THE ANKLE AND FOOT

The spica of the foot (Fig. 30) is also another figure-of-eight bandage. Pass a few complete circular turns of the bandage about the ankle and then bring the bandage along the outside of the heel of the (left) foot as at 1 and diagonally across the top of the foot to the base of the big toe 2. Then continue under the sole to the base of the little toe 3 and diagonally across the top of the foot again to the inside of the ankle 4, and so on. Other bandages appropriate to various parts of the body are also illustrated that by their help the proper method of their application may be understood (*see* Figs. 31, 32, 33 and 34). The triangular bandage (Fig. 35) made from a large handkerchief or piece of muslin a yard square, cut or folded diagonally from corner to corner, will be found invaluable in emergency cases. It is easily and quickly adjusted to almost any part of the body, and may be used for dressing wounds, or as a bandage for fractures, etc.



FIG. 30.—FIGURE-OF-EIGHT  
BANDAGE OF THE ANKLE  
AND FOOT.

### TRIANGULAR AND CRAVAT BANDAGE OF THE THIGH

The apex of the triangle is secured, as shown in Figure 36, by a cravat bandage about the waist. The middle of the base of the triangle then falls over the front of the thigh while the ends are passed around the thigh in opposite directions and are tied in front. This may be used to hold dressings in place on the groin.

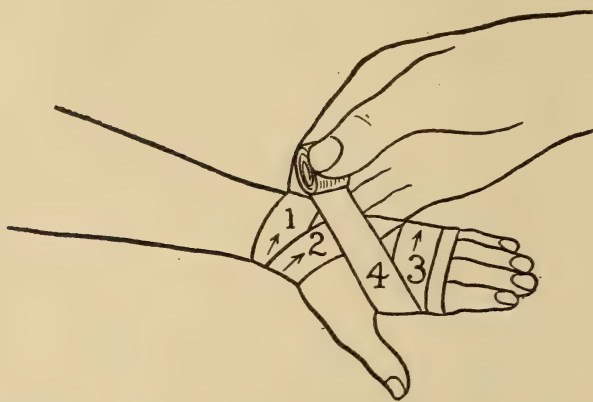


FIG. 31.—FIGURE-OF-EIGHT OF THE HAND. Make two or three circular turns about the wrist in the direction of the arrow at (1). Then bring the bandage diagonally across the back of the hand at (2), passing under the palm and making a complete circular turn about the hand, returning at (4). Then make a complete circular turn about the wrist and begin over again.

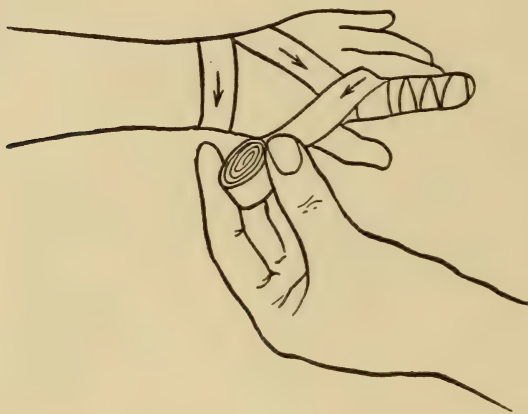


FIG. 32.—GAUNTLET BANDAGE, SHOWING THE COMPLETION OF THE BANDAGE OF ONE FINGER. Begin by making a few circular turns of the bandage about the wrist and then bring it over the back of the hand, circle the finger and return as indicated by arrow and make another complete turn about the wrist and start as before.

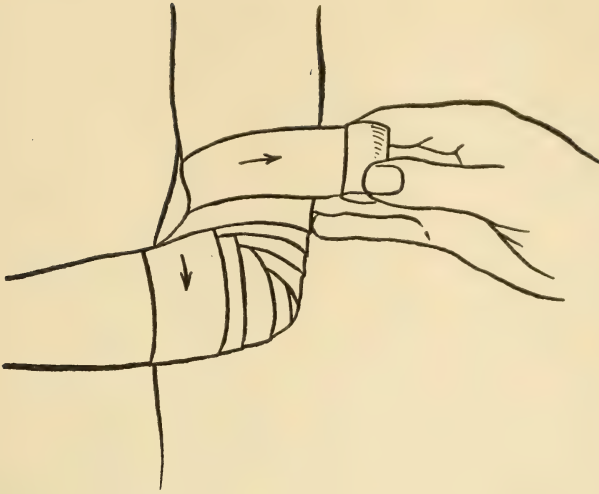


FIG. 33.—FIGURE-OF-EIGHT OF THE ELBOW. Application is begun by making several complete circular turns of the bandage about the elbow with the center of the bandage over the bend in the elbow, in front, and over the point of the elbow, behind. Then each time, in making the turns, one passes a little farther away from the center of the joint—up the arm and down the forearm.

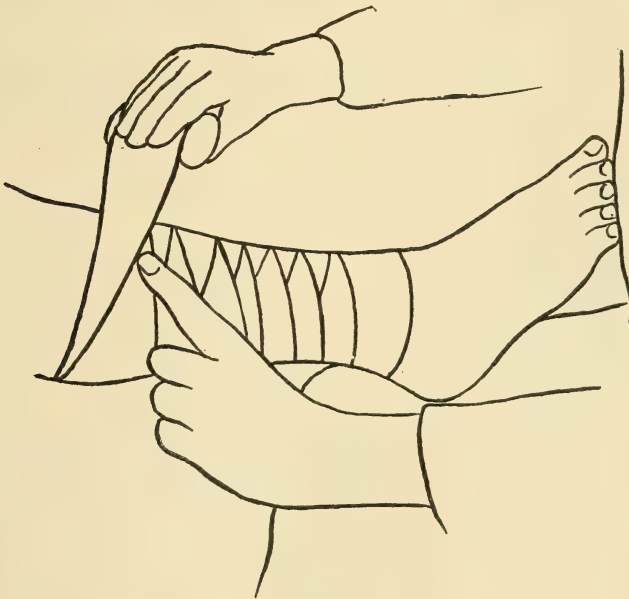


FIG. 34.—SPIRAL REVERSE BANDAGE OF LEG.

**TRIANGULAR BANDAGE OF THE FOOT**

Place the middle of the base of the triangle behind the ankle and bring the apex forward under the sole and up over the toes and top

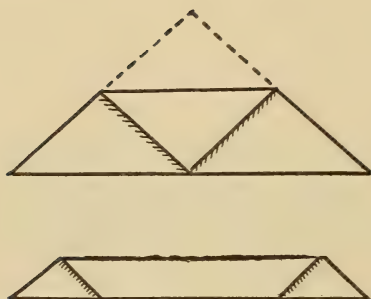


FIG. 35.—TRIANGULAR BANDAGE FOLDED ONCE AND TWICE.

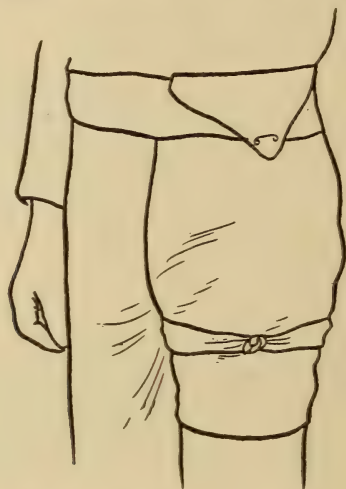


FIG. 36.—TRIANGULAR AND CRAVAT BANDAGE OF THE THIGH.

of the foot to the ankle. The two ends of the base are then passed in opposite directions so as to cross in front of the ankle, enclosing



FIG. 37.—TRIANGULAR BANDAGE OF THE FOOT.

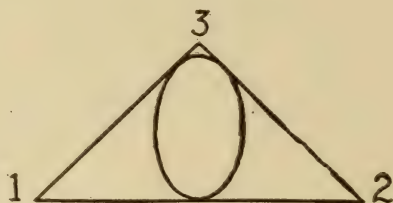


FIG. 38.—TRIANGULAR BANDAGE OF THE HEAD.

the apex, and are brought under the sole of the foot and tied together on the top (see Fig. 37). The apex is pinned toward the main part of the bandage. This will hold dressings on the foot.



## BANDAGES OF THE HEAD, BREAST AND SHOULDER

## TRIANGULAR BANDAGE OF THE HEAD

The square of cloth is folded diagonally from corner to corner, forming a triangle. This is laid on top of the head with the base to the forehead and the apex (3) at the back (Fig. 38). The ends 1 and 2 are carried in opposite directions completely around the head and tied in front. The apex is then pulled tight and turned forward and fastened to the main part of the bandage. This is used to hold dressings on the head. This triangle is made into a cravat bandage by folding the apex to the base and repeating the same operation a number of times, as in Figure 35.



FIG. 39.—TRIANGULAR BANDAGE OF THE HEAD.

## TRIANGULAR BANDAGE OF THE BREAST

The middle of the base of the triangle is held under the breast while one end (1) is carried over one shoulder and the apex (A) over the other shoulder, while the end (2) is passed under the armpit, and



FIG. 40.—TRIANGULAR BANDAGE OF THE BREAST.



FIG. 41.—CRAVAT BANDAGE OF THE JAW.

all three ends are tied together behind. This is used to support the breast when inflamed.

#### CRAVAT BANDAGE OF THE JAW

The middle part of the cravat is placed under the chin and the



FIG. 42.—CRAVAT BANDAGE OF THE EYE.

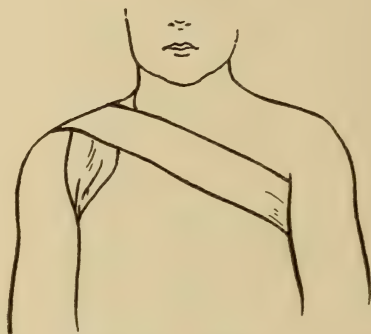


FIG. 43.—CRAVAT BANDAGE OF THE SHOULDER.

ends are carried over the top of the head in opposite directions and are brought down and tied under the chin (Fig. 41).

#### CRAVAT BANDAGE OF THE EYE

Place the middle of the cravat over the injured head and tie in front (Fig. 42).

#### CRAVAT BANDAGE OF THE SHOULDER

Place the middle of the cravat under the armpit and cross the ends, as shown in Figure 43, tying them under the opposite armpit.

### TRANSPORTATION OF THE INJURED

A temporary stretcher may be improvised from two or three coats or vests, or one overcoat, by turning the sleeves inside out, passing two poles through the sleeves, and buttoning the coats together underneath.

Potato or grain sacks, or pillow cases, may be used in the same

way, the poles passing in at the open end and out through holes in the bottom corners. A more convenient stretcher is made by rolling each side of a blanket or rug on a pole until the portion remaining

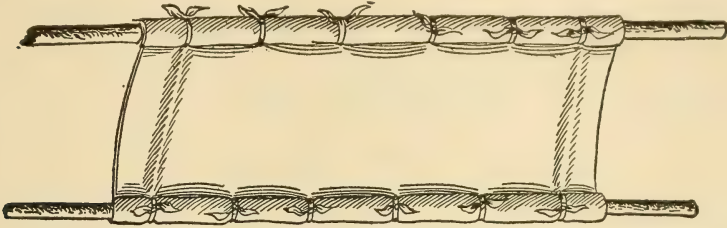


FIG. 44.—BLANKET STRETCHER.

is about twenty-two inches wide. The blanket is then secured by cord about each pole through holes made for the purpose (*see* Fig. 44). Two pieces should then be nailed or lashed across at each end of the stretcher to keep the poles apart.

## CHAPTER VII

### GROWTHS AND SWELLINGS

Tumors. New growths. Cancer. External swellings, as goiter, rupture, varicose veins, varicocele, piles.

### TUMORS

A tumor—in its original meaning—signifies simply a swelling. As commonly used it means a new growth or enlargement of a part, not due to recent injury or inflammation. A tumor consists of tissue different from that natural to the part; its origin is unknown and it is capable of increasing indefinitely in size at expense of the body.

Tumors occur at all ages in both sexes, and may attack any part of the body. Tumors are divided into two classes, benign and malignant. Benign tumors do not usually threaten the life of a patient unless by unusual size or situation, and they do not return when wholly removed.

#### (1) MALIGNANT TUMORS

**Symptoms of Malignant Tumors.**—Malignant tumors tend to break down and become ulcerated. They are not clearly defined but invade the surrounding tissues to which they are often fixed so as not to move freely with the skin. Their borders are not well marked. They grow more rapidly than benign tumors, are often painful, and the skin may be attached to them. Malignant growths frequently give rise to secondary growths in the glands near by and in remote organs. They often return after removal either at the original site or in another part of the body. Cachexia is another symptom of



cancer when it begins to ulcerate—not of early cancer. This means emaciation, pallor, loss of appetite and strength.

Malignant tumors are divided into cancers and sarcomas although both may be roughly included under cancer. Cancer is much more frequent than sarcoma. Cancer occurs more often in middle life (45 to 55), the “cancer age”—occasionally between twenty and thirty years of age.

#### (a) CANCER

**Causes of Cancer.**—The cause of cancer is still unknown. Two theories predominate: one that cancer is caused by microscopic parasites, the other that tissue cells assume unlimited capacity for growth by discarding, in some unknown manner, the usual control of the body over the growth of tissue.

The microbes of cancer are always being reported but have never yet been discovered. We do not know enough about the causes of normal growth to interpret the causes of morbid growths. Certain frequently accepted beliefs concerning cancer have been discredited by recent knowledge. Thus there is no sufficient evidence to indicate that cancer is in any way contagious.

While cancer may be unusually prevalent in certain localities and houses its contagiousness is not otherwise evident. Considering the frequency of cancer, which is apparently on the increase, it is not at all surprising to know of several cases in the same house, or instances in which both husband and wife are sufferers. One in every seven to twelve adults dies of cancer, according to statistics in various civilized countries. One woman in every eight women reaching the age of thirty-five years in the United States dies of cancer (Crile).

Heredity is a doubtful cause in cancer, although in some families (as, for instance, the Bonaparte family) its frequency is astonishing.

One cause is certainly known to favor cancer and that is *chronic irritation* of a part. This has been the most valuable acquisition to our knowledge in recent years. As applied to special parts we know that cancer of the breast is caused by single blows and by chronic inflammation; that cancer of the stomach follows usually upon chronic ulcer; that cancer of the womb is induced by the ulceration of old

tears originating in childbirth; that cancer of the gall-bladder is caused by the chronic irritation of gall-stones; that cancer of the skin is brought on by constant exposure to the sun and wind, or x-rays, or chemicals, as in those handling tar and paraffin. The great value of this knowledge lies in the fact that most of these causes may be avoided or remedied.

Chronic white patches seen on the tongue or inside of the cheek of smokers and others frequently result in cancer. Hairy moles on the skin should be removed lest they eventuate in cancer. Chronic ulcer, persistent scaly patches on the face, or irritation about the angles of the eyes, nose, lips and tongue, and any chronic inflammation of the skin, or other parts, should not be neglected, since they favor cancer.

The increase in size of a mole, wart or birthmark in adults should demand instant removal, as such a condition often means the beginning of cancer. Injuries to bones, as fractures, apparently predispose to sarcoma. Injury is accepted as a cause of malignant tumor in countries awarding governmental pensions and indemnities. Some authorities, however, deny that injury is a cause of malignant tumor. Irritation of bad and sharp teeth may lead to cancer of the tongue or inside of the mouth. Cancer may originate in the severe scars of burns. It may be brought on in the kidney by the presence of stones; in the appendix through chronic inflammation. Cancer of the penis may be favored by the irritation of a tight foreskin. Cancer of the prostate gland is induced by chronic enlargement, so common in old men.

**Early Operation.**—The moral to be deduced from the rehearsal of all these causes of cancer is plain. Such causative conditions should not be permitted to persist but should be removed promptly in the stage when surgery gives permanent cure. Physicians are greatly to blame for not always and everywhere preaching this doctrine. The more common situations of cancer are in the lip and stomach of man and in the breast and womb of women. When cancer is allowed to grow there comes a time when the growth extends into the neighboring glands, which enlarge and are felt as lumps in the armpit, in cancer of the breast, and under the jaw in cancer of

the lip and mouth. It is most important that cancer should be removed before such extension occurs.

Thus the chances of recovery are just reversed in cases with and without such evidences of extension. For example, in Johns Hopkins University it is found that permanent cure results in eighty per cent. of cases of cancer of the breast when operation is done before there is enlargement of the glands in the armpit of the same side as the cancer; whereas, in those cases operated after such involvement occurs, only twenty-five per cent. are permanently cured.

The enlargement of glands in the neighborhood of cancer is a late sign and should never be permitted. Dr. Tyzzer has recently found that it takes exactly thirty-nine days after inoculation of cancer into mice before extension to neighboring parts ensues.

#### CANCER OF THE BREAST

**Symptoms.**—Cancer of the breast begins as a lump in one breast, more often in the outer side and in the right breast. It may occur in either breast in any situation. It may be painless or painful. It is best felt by pressing the flat of the hand on the breast with the subject lying down, not by pinching a portion of the breast between the thumb and finger. Lumps occurring in the breast during nursing are usually inflammatory, but if these persist cancer may result. The appearance of any lump in the breast should demand the advice of a surgeon; also soreness of the nipples with any discharge from them. Frequently harmless (originally) growths become cancerous.

**Microscopical Examination.**—The most skillful surgeon cannot always distinguish the difference between the harmless and malignant growths in the breast until microscopical examination is made at the time of operation. The rule follows that all lumps in the breast, not acutely inflammatory, should be removed by the knife—the extent of operation depending upon whether the growth proves cancerous or not.

If this book had no other value than imparting this advice its publication would be fully justified because such information may make the difference between life and death. Every physician sees numerous cases, especially of cancer of the breast, where, through



modesty, ignorance, or fear of operation, the patient waits until too late. This is precisely what one should never do in any suspicious tumor. Never wait until it is patent that the growth is cancer. Always have the tumor removed while its nature is doubtful. This is the only way in which permanently successful operations are secured. No reasonable objection can be made to such a course.

All tumors of the breast should be removed as they may develop into cancer; their nature is determined absolutely at operation. If the tumor proves benign, so much the better. The knowledge that one has escaped a terrible danger is worth the operation, and one is rid of a growth which might have eventuated in cancer. There is no danger in operating on growths which do not require an extensive removal and even in the routine operation for cancer of the breast, where the whole breast and contents of the armpit are taken away, the death rate is but one in many hundreds of operations.

#### CANCER OF THE WOMB

Cancer of the womb is more difficult of diagnosis, because less readily appreciated by the touch and eye. It occurs at the outlet of the womb at the site of old lacerations occurring in childbirth. It also attacks the body of the womb in both single and married women.

**Symptoms.**—Those suggesting cancer of the outlet of the womb occur more often in women between thirty-seven and forty-seven years of age who have borne children.

There are watery discharges which stain the clothing brown, frequency of urination and itching about the external parts, and slight bleeding between the periods—just enough to stain the clothes. Pain, flowing, and a bad smelling discharge come later.

In cancer of the body of the womb symptoms appear after the “change of life” with the occurrence of a watery discharge and very little blood, at irregular periods, with also itching about the external parts. Later there are pain in the back and womb, and also flowing.

**Microscopical Examination.**—Patients having any such symptoms should at once submit to a physician’s examination. In cases occurring after the change of life the womb should be curetted, or



seraped, in order to get tissue for microscopical examination. This is the only way. It is suicidal to delay. Cancer is always a local disease to start with and there is a time in the growth of every cancer when its removal will be followed by permanent recovery.

#### CANCER OF THE STOMACH

Cancer of the stomach has been described in detail elsewhere in this volume. Here, as in other cases of cancer, early operation gives the best results. The difficulty of making an early diagnosis is great.

#### CANCER OF THE LIP

Cancer of the lip begins as a small wart, sore or crack, in men over forty years of age generally. Its growth is very slow and it may seem a trivial matter. It may repeatedly scab but it does not heal. But any sore on the lip of a man over forty years is a serious matter and should demand the immediate attention of a surgeon, because its early removal will be attended with success. Not only the growth itself but the glands in the neck should always be removed to secure the best results.

**Popular Education.**—Popular education is the sole means of curing cancer, for only when the public is informed as to the early signs of cancer, or the conditions which lead to cancer, will the surgeon get cases at a time when cure is possible. The general feeling that cancer is incurable arises from the fact that most cases of cancer in the past have not come to surgeons early enough. Cancer in its earliest or precancerous stage is readily and permanently cured by skillful surgeons.

**General Treatment.**—Early removal by the knife is the only form of treatment to be considered in most cases. The x-ray is not commonly advisable, except in some superficial malignant growths on the skin. Radium is much written about and may at some time be valuable in the cure of cancer. It is not an agent which can generally be recommended for the cure of cancer at present.

Some forms of electricity and heat (slow cooking) have apparently been very successful in the treatment of cancer in some parts

of the body, as in the bladder. It is too early to say that they will replace the knife, even in this locality. Treatment by all chemical pastes is simply courting disaster except in cases inoperable by the knife, when other means will often secure relief from suffering and prolong life—but not in the hands of advertising quacks.

#### (b) SARCOMA

The other form of malignant tumor, or sarcoma, is not nearly so common as cancer. It is often seen in the young and well nourished; it grows very rapidly; the skin is usually not adherent to the tumor; there is generally no pain. The favorite seats are the bones, glands of the neck, muscles, the brain and many other localities.

**Summary.**—Delay and neglect are suicidal in malignant disease. Cure is successful just in proportion as operation is done early. If dread of operation were less common the cure of cancer would be more common. The return of the disease after operation is due to the fact that the operation was done too late. The family physician is often to blame in not advising early operation. Cancer should be removed at so early a stage that the diagnosis is not positive without microscopical examination. If the rule to remove all tumors were followed many cancers would never occur. The special remedies advertised to cure cancer are humbugs.

#### (2) BENIGN TUMORS

There are many forms of the less harmful or benign tumors. These do not return if completely removed and do not endanger life unless they grow to a large size. Among these are the soft, flattened, fatty tumors of the shoulders, back, buttocks and other parts. The wen is common on the head and scalp, from the size of a pea to an egg, often appearing in groups.

It would be a waste of time to try to describe the other forms of benign tumors because it would be impossible to tell the layman how to distinguish them from malignant growths.

**GOITER**

A goiter is an enlargement of the thyroid gland which is situated in front of the upper part of the windpipe in the neck and in the region usually covered by the collar. When a person with goiter goes through the act of swallowing, the goiter rises with the "Adam's apple" or with the larynx or windpipe. This will distinguish goiter from simply a large neck. Goiter is common in many parts of the world, as in Switzerland, England, and in this country in the region of the Great Lakes, in the Northwestern states and California.

**Cause.**—The cause of goiter is unknown. Drinking water is thought to be the chief medium for communicating the disease, and experimenters have found that boiling and filtering water prevents the occurrence of the disease in persons drinking it, while the residue in the (Berkefeld) filter will produce the disease. Also as the disease occurs sometimes in epidemics, it is probable that it is caused by a special germ.

**Symptoms.**—The swelling in the neck may be quite general or it may be in the form of a distinct lump. The gland may often enlarge at puberty, but frequently the swelling disappears later. It usually becomes slightly enlarged during the time of menstruation in young women.

A persistent, distinct enlargement is called goiter. Goiter may remain about the same size indefinitely and produce no symptoms; if it continues to grow there may be pressure on the windpipe, with difficulty of breathing, hoarseness, cough, or difficulty in swallowing.

Sometimes it will disappear permanently, but this occurs chiefly in young persons. It has been found that after a simple goiter persists for fourteen to sixteen years without causing any apparent trouble, it may then give rise to symptoms not unlike those described below under exophthalmic goiter. Changes in the secretion of the gland cause poisoning of the whole system with resulting degeneration of the heart, kidneys and liver.

Thus we see the danger of allowing a simple goiter to remain indefinitely even if it occasions no noticeable discomfort or effects.



**EXOPHTHALMIC GOITER**

This is a disease in which there is enlargement of the thyroid gland, protruding eyeballs, rapid pulse (100 to 140), and fine trembling of the hands and tongue. The vessels in the neck throb and the face is often hot and flushed and covered with perspiration. Digestive symptoms are common, as vomiting, diarrhea, and jaundice, and the patient becomes extremely nervous and excitable in some cases. There may be weakness in the legs as seen in making a high step. The patient frequently loses weight. In this form of goiter there is an excess of the normal secretion poured into the circulation which poisons the patient.

**MYXEDEMA**

When there is an insufficient secretion of the gland there is just the opposite condition (to exophthalmic goiter) with slow pulse, dullness, apathy and dry skin; the face becomes coarse and swollen, the cheeks pendulous, and the tongue enlarged. The hands and feet also swell; thought and speech are slow and the gait is clumsy. This remarkable state is called myxedema. It occurs owing to wasting of the thyroid gland, or in some cases to goiter and inflammation of the gland, and will arise if the whole gland is removed. In the cretin, or child of goitrous parents, development is disturbed through lack of the thyroid secretion. Here we see a hideously distorted, imbecile dwarf, with large head, swollen protruding tongue and lips, large belly, and stumpy tottering limbs.

**TREATMENT OF GOITER**

A simple goiter of moderate size and not producing any trouble, in persons under adult age, should be treated medically and it will often disappear. Some form of iodine is most often used. The dose of iodid of iron for children of twelve years would be eight drops and for adults fifteen drops. The powdered, dried, thyroid gland of sheep is often very successful but is too powerful a drug for the layman to use. The giving of two to five grains of sodium iodid in one-half glass of water once daily to young people will often cure simple goiter.



When the gland is enlarging rapidly or steadily it should be surgically removed. A persistent goiter in adults may become cancerous, or symptoms of poisoning (thyrotoxic symptoms) or of exophthalmic goiter may develop. Moreover, it is a blemish. In these cases surgery is also advised.

Since the mortality of goiter operations is slight in the hands of skillful surgeons, it is wise for adults to have the growth removed by an able surgeon.

Exophthalmic goiter, of course, demands the services of a physician. Complete rest in bed with an icebag on the heart will improve the condition. The same treatment which is useful for simple goiter will do harm in exophthalmic goiter, such as the use of the thyroid gland and iodine preparations. All sorts of treatment is recommended but no treatment equals the results of surgery by which seventy-five per cent. are absolutely cured or greatly improved. Of the remaining twenty-five per cent. twenty per cent. are greatly benefited, except for occasional relapses of rapid pulse and tremors. Preliminary x-ray treatment may make the operation more safe. Like most surgical conditions the result depends upon the progress of the disease when operation is done. Persons who defer surgery until they have tried all kinds of medical treatment—poor, bad and worse—are apt to suffer from changes in the heart and other organs which are irreparable. The results of surgery are marvelous in exophthalmic goiter. Feeding of the dried thyroid glands produces wonderful results in the cretin and in myxedema.

Osler affirms that goiter may be prevented and cured in goitrous districts by drinking only boiled water.

## RUPTURE

Hernia, or rupture, consists of a protrusion of a portion of the contents of the abdomen through the abdominal wall under the superficial tissues and skin. Commonly the protrusion is a part of the bowel or its fatty covering (omentum). The usual seats of rupture are at the navel and groin. Rupture at the navel is called umbilical

hernia; that at the groin either inguinal or femoral, according to slight differences in site. Umbilical hernia is common in babies and occurs as a whole in only five per cent. of all ruptures, whereas rupture in the groin constitutes ninety-four per cent. (Fig. 45). One per cent. of females and six and seven-tenths per cent. of males are ruptured (Kingdon).

Rupture may also arise from the giving away of scars after

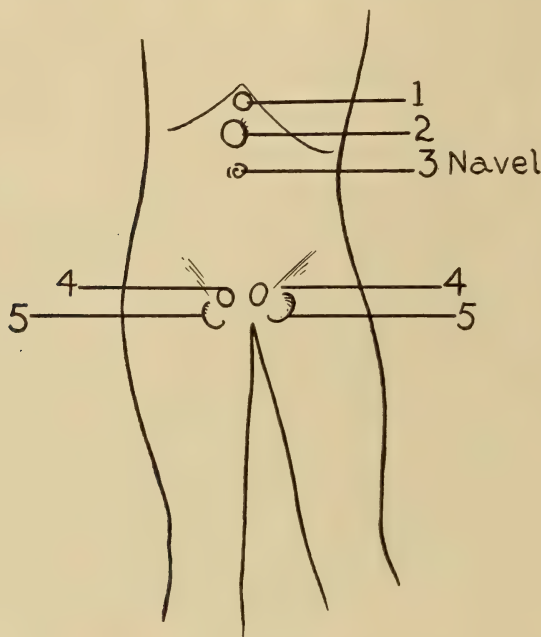


FIG. 45.—SITES OF RUPTURE. 1 and 2 Epigastric Hernia; 3 Umbilical Hernia; 4 Inguinal Hernia; 5 Femoral Hernia.

abdominal operations, and will occur at almost any point at which there is a scar. It is chiefly in wounds which have been kept open for drainage that rupture arises. Rupture rarely follows in wounds which are closed at operation and heal without the formation of pus.

**Causes.**—Rupture is sometimes present at birth. The ordinary cause of rupture is natural weakness of the structures at the points at which they ordinarily occur. Twenty-five per cent. of persons with rupture record a history of the same trouble in their parents. Rupture is six times more frequent in men than in women, and is

favorable by severe muscular work, obesity, chronic coughing, constipation, diarrhea, straining to pass water, sudden strain in lifting, and blows on the abdomen.

**Symptoms.**—Rupture first appears as a fullness or soft swelling, more noticeable on standing, lifting, coughing, or straining. It may disappear entirely on lying down or on pressure with the fingers. In the beginning there may be discomfort after standing or walking for any length of time, and later there is often a dragging pain or uneasiness complained of, or a sensation of weakness or gripping at the seat of rupture.

In case the rupture cannot be returned it is called irreducible, and is a more serious form.

The great danger of ruptures is in the likelihood of their being strangulated—that is, so nipped between the muscles of the abdominal wall that the blood supply of the bowel is cut off and the bowel completely obstructed. If this condition is not speedily relieved death will ensue in from two to eight days. Strangulated hernia is one of the four surgical emergencies which, unrelieved, causes death. The other three are suffocation, severe bleeding, and urinary obstruction.

Strangulation may be brought on in persons having rupture by heavy lifting, straining, coughing, or by a blow or fall, in forcing out more bowel or omentum than can be readily returned. The symptoms of strangulated hernia are sudden and complete constipation, persistent vomiting, severe pain about the navel, or at the seat of rupture.

The pain is often not attributed to the rupture, and doctors may fail to discover the true cause of the trouble by not always examining for rupture and by not asking the patient if there is one. The vomiting consists first, of the contents of the stomach, and then of yellowish stained fluid, and finally of dark material having the odor of excrement. The contents of the bowel come up “the wrong way” owing to the obstruction. Great weakness, distention of the belly, retching, hiccough, thirst, profound exhaustion, and death follow, if the condition is not at once remedied.

In some cases where the obstruction is not complete, the symptoms

are comparatively mild—as occasional vomiting, slight pain, and partial constipation.

**Treatment.**—If the patient cannot promptly return the protrusion a surgeon should be secured at any cost, the patient, meanwhile, lying in bed with an icebag or cold cloths over the rupture. The surgeon will reduce the rupture under ether or by operation. Strangulation of any rupture may occur but is less likely to happen in those who wear a well-fitting truss.

Still it is always a dangerous possibility, and this fact together with the liability of the rupture to increase in size, make a surgical operation for complete cure advisable in proper subjects.

Two means of treatment are possible—the wearing of a truss, and a surgical operation. By wearing a truss fifty-eight per cent. of ruptures recover completely in children under one year. In children from one to five years, with rupture, ten per cent. are cured by the truss.

Statistics show that in rupture which has been acquired after birth but five per cent. recover with a truss after the age of fifteen, and but one per cent. after thirty. The truss must be worn two years after cure of rupture in children, and in adults the rest of their lives.

A truss consists of a steel spring which encircles the body and holds in place a pad which fits over the seat of hernia.

The truss is most satisfactory in ruptures which can be readily reduced. In very large or very small hernias, the action of a truss is not so effective. The truss should never be applied in hernias irreducible or but partially reducible. The pressure of the truss on the irreducible tissues may cause inflammation and perhaps gangrene and strangulation. Every person with a reducible hernia should wear a proper truss until the rupture is cured by some means. Such a truss should keep in the hernia without pain or discomfort. It should be taken off at night and replaced in the morning while the patient is lying down. In cases where the protrusion occurs during the night a truss must be worn day and night, but often a lighter form will serve for use in bed. To test the efficiency of a truss let the patient stoop forward with his knees apart, and hands on his



knees and cough. If the truss keeps the hernia in it is suitable, if not, it is probably unsuitable.

Operations for the complete cure of hernia are successful in ninety-five cases out of one hundred in ruptures in the groin, in suitable subjects. The death rate is but one in five hundred to one thousand operations when done by surgeons skilled in this special work. Patients with very large hernias, those who are very fat and those in advanced years are unfavorable subjects for operation. In young men operation—if it can be done by a skilful surgeon in a hospital with all facilities—is usually to be recommended in every case of rupture. Irreducible ruptures should be operated on in most cases. Umbilical and ventral hernias, due to operations, may be held in place by a wide, strong belt about the body which holds a flat or circular plate over the rupture.

These persons with umbilical hernia are usually the worst sort of patients for hernia operations, being very stout, of middle age or older, and without any muscular development. Hernias following operations may be cured by surgery if the tissues are sufficiently strong.

Umbilical hernia in babies is very common after the cord has dropped off. There is a protrusion at the navel which increases in size on coughing, straining, or crying. If the rupture is pushed in and the skin is brought together from either side in two folds over the navel, so as to bury the navel out of sight, and held in this position by a strip of surgeon's adhesive plaster, reaching across the front of the abdomen and about two and one-half inches wide, complete recovery will usually take place within a few months. It is well to cover the plaster by a snug flannel band about the body. The plaster may be replaced as need be, and should in all cases be applied by a physician if one can be secured.

## VARICOSE VEINS

Varicose veins are unnaturally, irregularly, and permanently dilated veins which are more commonly present on the inside of

the legs but are also found on the outer side, and in the scrotum and lower bowel. (See Varicocele and Piles.)

**Symptoms.**—They stand out on the skin as bluish, knotty, and winding cords which flatten out when pressure is made upon them and shrink in size when the patient lies down. Sometimes bluish, soft, rounded lumps, or a fine, branching network of veins may be seen. The skin over varicose veins is often discolored owing to escape of blood from the vein. Varicose veins occur in twenty per cent. of adults, and in eighty per cent. of cases they appear before the age of twenty-five.

Frequently varicose veins are present for years without causing trouble, and without increasing in size. The writer has had quite marked varicose veins in one leg for thirty-five years without having felt the slightest inconvenience. In other cases they cause a feeling of weight and dullness in the legs, especially on standing. When they are extensive the legs may become swollen and hard, and eczema with itching is frequent. This leads to scratching and sores, or varicose ulcers, which are chronic and difficult to heal.

Occasionally an old varicose vein may break open and give rise to profuse bleeding. Rarely the blood may clot in a varicose vein; this endangers the patient's life because of the possibility of the clot escaping into the circulation and plugging some vital vessel, as in the lung. If the swelling of a leg from varicose veins is increasing and marked the patient should remain in bed until a doctor decides if there be clotting of the blood in a vein.

**Causes.**—Varicose veins are more common in women. It has been commonly taught that obstruction to the flow of blood in veins is the cause of their varicosity. Thus in pregnant women varicose veins of the leg are very common from supposed pressure of the womb. Piles are said to be due to pressure on the veins and obstruction to the flow of blood upwards in the lower bowel brought on by constipation, a pregnant womb, enlarged prostate gland, etc. But it has been shown that the veins enlarge in pregnant women before the womb is big enough to press on them, and it is now generally recognized that there is some chemical change in the blood, or tendency in the veins to grow larger. Pressure

upon the veins, as by a garter about the leg or other of the causes mentioned, favor varicose enlargements, as well as poor circulation in heart, liver, and lung diseases.

**Treatment.**—Varicose veins are exceedingly common and, if they are not very extensive and produce no discomfort, they may be ignored. Exercise in the open air is as desirable as lying down every afternoon, if possible. Massage of the affected leg with alcohol is desirable, if there is no eczema. If there is pain, discomfort, or swelling in the limb it is advisable to apply a flannel bandage (four inches wide and cut on the bias) from the toes to a point above the varicose veins. A rubber perforated bandage about three inches wide may be used in place of the flannel, if applied over a long stocking; or an elastic stocking sold by instrument dealers may be used. Whichever form of support is used it should be put on before rising in the morning and removed after the patient retires at night.

Surgical operation will cure some varicose veins. It is not generally recommended, unless tumor-like dilatations form on the legs or a clot forms in the vein, or a thin-walled vein crosses the shin bone where it is liable to injury and the formation of blood clot.

When the veins in the leg and large vein in the thigh (saphena vein) are both varicose, operation should be performed. Bleeding from a broken varicose vein is stopped by the pressure of a sterilized gauze bandage over the wound while the patient lies on his back with his foot raised by a pillow on a box.

## VARICOCELE

This consists of an enlargement of the veins in the scrotum above the testicle of the male, on the left side in most cases. The large veins feel much like a bunch of earthworms with the testicle at the bottom. The testicle on the left side is apt to be somewhat smaller and softer than the one on the right. The skin of the scrotum commonly hangs down further on the side with the varicocele. If the enlargement of the veins causes no discomfort, it may be entirely neglected, as the swelling is not of the slightest consequence. When the swelling causes trouble there may be a dis-

comfort or dragging pain in the groin and testicle, and perhaps about the rectum and bladder. In some cases pain in the small of the back may be the only symptom. There are young men who become much depressed and melancholic on account of varicocele. Advantage is taken of this fact by quacks, who find it to their profit to advertise all sorts of horrible and preposterous effects which result from varicocele. While, as has been noted, the testicle on the affected side may become soft and shrunken, this does not prevent the subject from having normal sexual powers nor does it take away his ability to propagate. Varicocele is a very slight and usually harmless disability. It occurred in one out of every five males in ten thousand recruits (Senn).

**Causes.**—The spermatic vein on the left side empties into a large vein (renal) at right angles, while the right enters into the same vein on the other side at an acute angle and so the blood flows more freely from the right testicle. Some believe ungratified sexual excitement to be a cause. When a man reaches middle age a varicocele usually ceases to cause trouble.

**Treatment.**—The patient needs to be assured emphatically that there is no danger of impotence in varicocele. He should take cold shower baths daily, or else bathe the scrotum in cold water for five minutes night and morning. Constipation, if present, should be cured. The application of a snugly fitting jockey strap, or suspensory bandage will give the most relief. The former is the most efficient and may be bought at athletic supply stores. When pain is considerable, the testicle much shrunken, and the patient desires a permanent cure, this may be secured by a surgical operation which does not endanger life and is a simple affair. The enlargement of the veins cannot be removed by the use of cold water and the support of a bandage, but usually they will give relief from the discomfort of varicocele.

## PILES

(*Hemorrhoids*)

Piles consist of enlarged veins at the outlet of the bowel. Not only is there a dilatation of the veins, but there is a growth of new



tissue about them so that they form little tumors. Piles are internal and external.

#### EXTERNAL PILES

**Symptoms.**—These are bluish swellings or little lumps which project from the bowel. They become inflamed at times, when they are itchy and exquisitely painful and tender so as to make walking, sitting and bowel movements difficult. In the course of time these become mere tabs or fringes of flesh and cause no trouble, unless they become irritated, on account of uncleanness or from some other cause.

**Treatment.**—When there are external piles the parts should always be washed with cold water after each movement of the bowels, to avoid irritation. The bowels should be kept regular in any form of piles and the patient should take one-half teaspoonful of aromatic fluidextract of cascara sagrada at night or, in inflamed piles, a teaspoonful, more or less, of artificial Carlsbad, Epsom, or Glauber's salts in a whole glass of water on arising.

Equal parts of sulphur and cream of tartar is an old-fashioned domestic remedy of which a teaspoonful may be taken each morning, if salts do not agree. If the external piles become inflamed, and the soreness is great, the patient should rest in bed and avoid the use of meat and tobacco. Ice water should be injected into the bowel three times daily and an icebag or hot poultice should be kept continually on the inflamed parts. The hot flaxseed poultice will probably give most relief. Certain drugs also are of much benefit. None is better than the old witch hazel extract applied frequently in a pure state.

An ointment of nutgall and opium, kept by druggists, or gauze saturated with a mixture of boroglycerid one part, and water three parts, should be placed on the inflamed piles and kept warm with a hot-water bag.

While this treatment will usually give relief in time, surgery is the quickest method of cure by cutting into inflamed piles containing blood clots and removing the clots, or, in cases with inflammation of the folds of flesh about the anus, these may be cut away.

## INTERNAL PILES

**Symptoms.**—These are enlarged veins which form little tumors just within the outlet of the bowel (anus) and are often protruded during movement of the bowels. They are soft, purplish, irregular lumps. When rubbed by the excrement in movement of the bowels they bleed; bleeding at the closet is the chief sign of internal piles.

It is usually the only sign in uncomplicated cases. Later blood may be lost at other times, and the loss of blood may be so great as to cause pronounced paleness and weakness. There may also be some pain with the movement of the bowels but, when there is much pain during and after the movement, it is probable that there is also a fissure, crack or ulcer in the mucous membrane which needs surgical attention. Fissure of the bowel frequently exists without piles, is an exceedingly painful trouble, and may break down the nervous system owing to the violent burning pain which begins during the act of moving the bowels and may continue for some hours thereafter.

Then with internal piles there is often bleeding, sometimes itching and some pain during the movement. There may be some discharge of mucus from the bowel. Loss of sexual power and desire may rarely be due to piles. It not infrequently happens that the piles come out during the bowel movement, when they should be thoroughly washed with cold water, greased with vaselin and put back. Sometimes this is impossible, but on lying down, with cold cloths or ice against the piles, the mass may shrink so as to admit of its return. When a large mass is thus protruded and cannot be returned, and becomes nipped by the anus muscle, it undergoes inflammation and is very painful, but a cure may result from its destruction. Such a mode of cure is not a safe or desirable one, however.

**Examination.**—Before speaking of treatment the writer would like to emphatically advise any person with piles to submit to a thorough examination of the inside of the lower bowel by a physician in order that the possibility of a tumor in the bowel may be excluded. Since piles is a common and comparatively harmless disorder it is apt to be treated without due care, and several cases in which

cancer was overlooked until too late have come to the author's notice. The occurrence of bleeding or pain in this region should always demand a proper examination by sight and touch to exclude the presence of new growths within the bowel.

**Treatment.**—Medical treatment may temporarily stop the symptoms, as pain and bleeding, but it cannot remove the dilated veins. When symptoms occur only occasionally such treatment may suffice. The patient must take regular exercise, give up overeating and drinking, and keep the bowels regular—as advised for external piles. The Carlsbad salts in the morning is particularly indicated. After every movement of the bowels the external parts should be washed with cold water and then a pint of cold water should be injected into the bowel. When the water comes away the outer parts should be dried with a soft cloth.

If the piles come out they should be returned after injecting the cold water and a suppository containing ten grains of extract of hamamelis, five grains of tannic acid and one-third grain of extract of belladonna, should be inserted in the bowel, and another should be inserted at bedtime. Two teaspoonfuls of the extract of witch hazel added to the cold water injections increase their value. If there is much itching an ointment containing thirty grains of orthoform in a half ounce of lard may be useful when introduced by the finger. The compound gall-ointment or glycerite of tannin may be found successful in some cases. They also are applied by inserting the finger into the bowel.

The only positive cure for piles is surgical operation; this completely removes them. Self-treatment of piles is not recommended, as a physician can do much better and an examination is always advisable and should be made with an instrument through which the physician can see into the interior of the bowel. By this means, and by introduction of the finger, the doctor can rule out other causes of bleeding mistaken by laymen for piles.

**Causes.**—Piles are seen chiefly in adults. Overeating and lack of exercise favor piles. Constipation is the most common cause in bringing pressure on the veins of the lower bowel and preventing the proper return of blood. Other causes producing pressure on the veins

and favoring the occurrence of piles are pregnancy, tumors of the womb, enlarged prostate gland in men. Straining to pass water may induce piles. Fatigue, exposure, horseback exercise, or an alcoholic debauch may lead to their formation. Certain diseases occasion the production of piles, as disorders of the heart, lungs, and liver.



## CHAPTER VIII

### MISCELLANEOUS COMMON SURGICAL DISORDERS

Bunion. Housemaid's knee. Callus. Corns. Ingrowing toe nail. Run-around. Ganglion. Foreign bodies in the eye, ear, or nose. Swallowing foreign bodies. Boils. Carbuncles. Snake bites. Rabies—hydrophobia.

#### BUNION—HOUSEMAID'S KNEE

Bunion is an inflammatory swelling of the bursa, or sac, placed so as to cover the outside of the joint of the great toe, where it joins the foot. This sac acts normally as a cushion protecting the joint. The swelling or bunion may not cause much trouble or, if acutely inflamed, it may be hot, red, tender, and very painful. A similar swelling from the same cause may sometimes occur on the joint of the little toe where it joins the foot.

**Cause of Bunion.**—Bunion of the great toe is caused by wearing shoes with short, pointed toes which force the great toe toward the little toe and thus make the great toe joint more prominent, and so more readily injured.

**Symptoms of Bunion.**—The bone of the foot entering into the great toe joint becomes enlarged and sometimes an abscess forms which breaks open and leaves a hole or sinus, discharging much of the time.

**Symptoms of Housemaid's Knee.**—In housemaid's knee a similar sac, or bursa, normally protecting the kneepan, becomes inflamed in persons who work on their knees, as in scrubbing floors, laying carpets, etc. There is a swelling which may be as large as an egg covering the lower part of the front of the kneepan. It appears

to contain fluid. It may come on slowly with little pain, or it may appear suddenly and may be hot, tender, and painful. Occasionally an abscess may form.

**Treatment for Bunion and Housemaid's Knee.**—The treatment for the painful variety of either bunion or housemaid's knee is much the same. The patient should rest in bed with the foot raised on a pillow and an application of cloths kept constantly wet with ice or cold water (or an icebag; or a thick covering of cataplasma kaolini) on the bunion or knee until the inflammation has subsided. If the trouble is chronic, or the acute inflammation does not abate under the treatment advised, the case is one for the surgeon. If there is an abscess it must be opened.

In chronic housemaid's knee the thickened tissues may have to be removed, and in chronic bunion the head of the bone of the foot, entering into the great toe joint, must be removed to get the toe in proper position. In the milder cases of bunion, wearing proper shoes with broad toes and with the inner border of the shoe forming a straight line from the heel to the toe, and with the heel extended forward on the inner side, is to be recommended. Also, when the bunion begins to be sore, painting it with tincture of iodine at one sitting, until the skin is very dark, will often secure recovery. A light splint attached to the inner border of the foot and great toe may be applied at night by elastic straps to pull the great toe into line.

In bunion of the little toe one may use a bunion plaster to relieve the pressure of the boot. At night a hot, wet, small towel may be applied over the joint with a hot water bag to keep it warm, or iodine may be painted on the swelling.

## CALLUS AND CORNS

A callus is a thickening of the outer layer of skin due to continuous pressure of the skin between some hard surface and a bone. If a callus causes pain, as on the sole of the foot, from pressure on the underlying soft parts, it must be removed.

A corn is a cone-shaped local thickening of the outer layer of skin

of the feet, due to pressure and friction of the shoes, or of opposed surfaces of the skin between the toes. A corn or callus is not painful in itself but only in bearing down on the sensitive structures beneath. Continued irritation of corn or callus may lead to inflammation around and beneath with formation of pus. Ordinarily corns are tough, yellowish, horny masses but, when moistened by sweat between the toes, they are white and are called soft corns.

**Treatment.**—Comfortable shoes are the first requisite—well-fitting and neither tight nor loose. Pressure may be taken from corns by the use of corn plasters. To remove corns or callus the foot should be soaked for a long time in hot water containing washing soda (2 tablespoonfuls to 1 quart of water). Then the hard skin should be scraped or pared away with a sharp knife, being very careful not to cut into the living skin.

Another useful method consists in painting a corn or callus, night and morning for five consecutive days with the following prescription, when both the coating and corn or callus will be removed by soaking the same in hot water:—

Salicylic acid.....	30 grains
Tincture of iodine.....	10 drops
Extract cannabis indica.....	10 grains
Collodion .....	4 drachms

When the tissues about a corn become inflamed the patient must rest, with the foot elevated and wrapped in a thick layer of absorbent cotton saturated with a hot solution of corrosive sublimate (one large tablet to the quart of water) and covered with oil silk or rubber cloth. Pus must be let out with a knife which has remained in boiling water for five minutes. If corns are pared away the foot should first be made absolutely clean by soaking in hot soapsuds and then by washing in alcohol. The knife or razor should be boiled for five minutes or soaked in alcohol ten minutes. The latter method does not destroy the knife edge as does boiling. If the knife or skin are not clean, and blood is drawn, one may get an infection of the part and, in old people and those with feeble circulation, gangrene or erysipelas may result.

Soft corns are removed as above by soaking and seraping, or by the use of collodion mixture, applied but two days, owing to the more delicate nature of the skin. Then the corn should be dusted with a mixture of equal parts of zinc oxid and boric acid, and the toes kept apart by pads of absorbent cotton.

### INGROWING TOE NAIL

**Causes.**—This is a condition in which the flesh along the edges of the great toe nail becomes inflamed, owing to either overgrowth of the nail or to pressure of the soft parts against it. Improper foot-gear is the common cause—as shoes which are too narrow across the toes, or not long enough, or those with high heels which throw the toes forward, so as to be compressed by the toe of the boot, especially in walking down hill.

Toe nails should be cut straight across. If the corners are cut off the nail has less support from the tougher skin at the end of the toe and presses more on the delicate skin at the sides. Also when the corners of the nail are cut off the flesh crowds in at the corners and, when the nail pushes forward in its growth, it presses on the flesh.

Inflammation from ingrowing toe nail usually arises along the outer edge of the nail. The flesh becomes red, tender, painful, and swollen, so that it overlaps the nail. After a time “matter” or pus forms and finds its way under the nail, and the parts about it ulcerate. “Proud flesh” or excessive granulation tissue springs up and imbeds the edge of the nail still further. This condition may persist and give trouble for months or years, if not properly treated. Nails which naturally round upward are more apt to produce trouble because the edges are then more likely to grow down into the flesh.

**Treatment.**—First cut away the part of the upper of the shoe which covers the offending great toe, to remove pressure from it. A hot flaxseed poultice applied at night will relieve inflammation and pain. Soaking the feet frequently in hot water and practicing unusual cleanliness will hasten recovery. There are two methods of



curing the trouble; one, to keep the flesh away from the nail, the other, to cut the nail away from the flesh. The first is accomplished by tucking and crowding a strip of absorbent cotton under the outer and front edges of the nail to lift it from the flesh. To further lessen the inflammation the cotton may first be soaked in silver nitrate solution (ten grains to the ounce of water), or tannic acid or powdered alum may be dusted on the flesh before the cotton is tucked between it and the nail. This should be repeated every day after soaking the foot.

The other way of keeping the nail away from the inflamed flesh is by the use of a thin strip of silver one-quarter of an inch wide. This is bent so that it will hook up under the edge of the nail and also will encircle the greater part of the under surface of the great toe.

The effect of placing the foot on the ground is to lift the edge of the nail from the sore parts by means of the hook. A strand of sterile gauze is laid over the raw surface after it is powdered with alum and the hook is inserted on top of this; whether absorbent cotton or the hook is used they must be kept in place by bandage or adhesive plaster. The hook is changed daily and the foot soaked and dressed. A few weeks' wear should bring about a cure of the condition.

To prevent the recurrence of ingrowing toe nail proper footgear should be worn. The shoes should be broad at the toes, of sufficient length, and have low heels. Many operations have been devised to cure ingrowing toe nail, but if the flesh is kept away from the edge of the nail it may be avoided. If the toe is badly inflamed a surgeon's advice should be sought.

## RUNAROUND—WHITLOW OR FELON

A runaround consists of an inflammation of the soft parts around a finger nail. It is more common in the debilitated but may occur in any one, owing to the entrance of pus germs through a slight prick or abrasion unnoticed at the time. Pus may form in various places: at

the root of the nail, between the skin and root of the nail, under the middle of a nail from a prick between the nail and underlying skin, at the tip of the finger, and at the side of the nail from infection through the abrasion caused by a "hang nail."

**Symptoms of Runaround.**—The trouble begins with dusky redness, slight swelling and pain which is violent, and throbbing, and is worse when the hand is held down. Pus forms in one of the places noted in about forty-eight hours. The nail is often lost, and three months are required to get a complete new nail, and five months before the nail is as perfect as before. In mild cases no pus forms and the inflammation soon subsides.

A whitlow or felon is a much more serious trouble than is a run-around. It begins generally as a painful swelling of one of the last joints of the fingers on the palm side.

**Causes of Felon.**—Among the causes are blows, scratches, pricks. Often there is no apparent cause, but in some manner the germs gain entrance.

The inflammation may be situated in one of four places: directly under the outer layer of the skin (epidermis), in the loose tissue under the skin (subcutaneous), in the sheath of the tendon which bends the finger, or under the membrane which covers the bone of the finger (periosteum). Formerly these were called bone felons, the idea being that the inflammation was always on the bone under the periosteum; so that the routine treatment consisted in making a rapid deep cut through all the soft tissues directly to the bone. This is bad surgery because a deep cut may be unnecessary, but particularly since one may spread the inflammation to deeper parts when it is superficial.

**Symptoms of Felon.**—The end of the finger becomes hot and tense and may throb with excruciating pain. If the inflammation is chiefly of the surface there may be redness, or if of the deeper parts, the skin may be actually pale. There is usually some fever and the pain is made worse by permitting the hand to hang down. If the inflammation is deep in the sheath of the tendons the danger is that it may spread along the tendon. In the case of the little finger and thumb the inflammation may spread into the palm of the hand and from thence into the forearm along the course of the sinews or ten-

dons of the muscles, while this is prevented in the case of the other three fingers, the sheath of their tendons being closed at the point where the fingers join the palm.

Death of the bone of the last finger joint, stiffness, crippling, and distortion of the hand, after many weeks of pain and multiple incisions in the hand and arm, or even death from blood poisoning may ensue unless prompt surgical treatment is obtained.

The two conditions of runaround and felon run into each other so that a better classification consists in superficial and deep felon. In deep felon involving the bone or tendon sheath there is often tenderness and swelling of the glands in the armpit of the affected side.

**Treatment of Runaround and Felon.**—In the beginning of superficial felon, or runaround with redness and swelling and pain about the nail or tip of the finger, the whole of the end of the finger below the last joint may be painted once with tincture of iodine and, after it is dry, the finger may be wrapped in ten layers of cheesecloth wet with a saturated solution of boric acid (as much as warm water will dissolve), and the whole covered with a piece of oil silk and bandage. If this does not allay the pain and inflammation within twenty-four hours from the time of onset, it is a case for the surgeon. It may only be necessary to open the epidermis, as in pricking a blister, or in trouble at the root or under the nail it may be necessary to remove part of the nail. In deep felon, with severe and throbbing pain in the tip of the finger or thumb and perhaps no redness whatever, it is unwise to wait and poultice at all, but the patient should be given ether and the finger should be opened by a surgeon to prevent agonizing, sleepless nights, blood poisoning, and perhaps extension of the abscess along the tendon sheath into the hand and arm.

In making the incision the surgeon cuts in on either side of the tendon and, if there is no distention of the sheath of the tendon with pus, he refrains from opening it but opens the covering membrane of the bone to allow of escape of pus there. It may be necessary to make several incisions in the finger and hand, if the case is not operated early. The same antiseptic poultice of boric acid is applied



to the finger or whole hand, as noted above, and it is changed every twenty-four hours to keep it moist. The hand must be placed upon a thin board splint, running outside the dressing along the back of the hand from the finger tips to within two inches of the elbow, and kept in place by adhesive plaster and bandage, and the whole held in a sling so that the hand is not allowed to fall down.

In a case of deep felon, when impossible to secure a surgeon's services, it would be best to cut early down to the bone. The cut should be made with a very sharp knife (which has been boiled three minutes) and the incision should be in the middle of the soft part of the last joint of the finger about one-quarter of an inch below the joint and extending one-half to three-quarters of an inch toward the tip of the finger. There is no danger from too much bleeding.

The hand should be immediately placed in a warm solution of boric acid and, when the bleeding ceases somewhat, the dressing advised above should be applied.

### WEEPING SINEW OR GANGLION

This is a swelling ranging in size from a large bean to an inch or more in diameter. It is occasionally seen on the front of the wrist or top of the foot, but is more commonly found on the back of the wrist.

**Symptoms.**—The swelling is painless, hard, and elastic, and not tender unless pressed very firmly. It frequently follows some exertion, the patient feeling something give way. A few days later the swelling appears and may gradually increase in size and weaken the wrist or make some movements painful, such as playing the piano. The overlying skin is not altered in appearance, and freely movable. After reaching a certain size the ganglion often ceases to grow, but may persist indefinitely; occasionally a ganglion may disappear spontaneously. A ganglion is a sac attached to the sheath of a tendon, or membrane (capsule) enveloping the joint, and contains a clear, syrupy fluid or gelatinous substance. Its cavity usually does not communicate with that of the tendon sheath or joint.



**Causes.**—The origin of ganglia is somewhat uncertain, but they are thought to be due to degeneration of tissue surrounding a tendon sheath or joint.

**Treatment.**—The simplest treatment consists in suddenly exerting great pressure on the ganglion with the thumb, or in striking it a sharp blow with the back of a book, so that the sac is ruptured and the contents escape into the surrounding tissues. The sac may not be ruptured, and it usually fills up again even if it is. Another ready method is to hold a coin in place (with pressure exerted on the ganglion) by means of a strip of adhesive plaster. After two weeks the sac may be obliterated by its walls growing together. A few drops of tincture of iodine injected by a doctor into the sac with a hypodermic syringe, without drawing any fluid, may cure the ganglion in a week. If the ganglion is large, or recurs after simpler methods of treatment have been tried, it should be dissected out by a surgeon.

### FOREIGN BODIES IN THE EYE, EAR, AND NOSE

For methods of treatment of these conditions the reader is referred to pages on these subjects.

### SWALLOWING FOREIGN BODIES

Parents are often greatly alarmed by children swallowing coins, pins, safety pins, nails, etc. These may lodge in the gullet, and cause pain and difficulty in swallowing, but more often they pass through the digestive tract and appear later in the bowel passages. Vomiting sometimes continues until the foreign body escapes from the bowel, so that it is not necessarily a sign that the coin or other substance is still in the stomach.

**Treatment.**—Do not give emetics or cathartics as it is dangerous to attempt to expel foreign bodies in this way. It is better to give the patient as much bulky food as possible, as mush, baked potato, bread and milk, with the idea of surrounding the foreign body with waste matter and so carrying it along out of the bowel. From eighteen

to thirty-six hours is commonly required for substances to pass through the stomach and bowels. After this time a dose of fluid-extract of cascara sagrada or other mild laxative may be given.

Usually no harm results from the swallowing of foreign bodies by children or adults. Sometimes they may lodge just inside the exit of the bowel and may be removed by the finger.

## BOILS

A boil is a circumscribed inflammatory process caused by the entrance of pus-producing germs into the skin, either through the pores (the mouths of the sweat glands) or along the shafts of the hair, and in this way invading the glands which secrete a greasy material (sebaceous glands). In either case the pus germs set up an inflammation of the sweat or sebaceous glands and the surrounding structures of the skin, and a small, red, itching pimple results.

Rarely, after a few days, does the redness and swelling disappear, and the pus, if any, dry and the whole process subside. This is called a blind boil. But usually the boil increases in size for several days, until it may be as large as a pigeon's egg. It assumes a bright-red, sharply defined, rounded shape, with a conical point, and is at first hard and then softens, as pus or "matter" forms. There is severe pain of a throbbing, boring character, which is worse at night, and destroys the patient's sleep and appetite; there may be some fever. The glands in the neighborhood may be enlarged and tender, owing to some of the pus germs escaping from the boil and lodging in the glands.

If the boil is not lanced, it reaches its full development in seven to ten days with the formation of a central core of dead tissue and some pus, which gives to the center of the boil a whitish or yellowish-brown appearance. The boil then breaks down spontaneously in one or more places (usually only one) and discharges some pus, and, with a little gentle pressure, also the white, central core of dead tissue. The remaining wound closes in and heals in a week or two. Boils occur singly or in numbers, and sometimes in successive crops.

When this happens it is because the pus germs from the previous boils have invaded fresh areas of skin.

**Causes.**—Boils are thus contagious, the pus germs being communicated to new points on the patient's skin, or to that of another person. Local irritation of the skin, from whatever cause, enables the germs to grow more readily. The existence of skin diseases, as eczema ("salt rheum"), prickly heat, and other sources of itching and scratching, is conducive to boils, as the pus germs contained in ordinary dirt are rubbed into the irritated skin. Whenever the skin is chafed by rough clothing, as about the wrists and neck by frayed collars and sweaters, etc., boils are likely to occur. Also when the face and neck are handled by barbers with dirty hands or instruments, a fruitful source is provided for their invasion. While boils are always the result of pus gaining entrance to the skin glands, and, therefore, strictly due to local causes, yet they are more prone to occur when the body is weakened and unable to cope with germs which might do no harm under other circumstances.

The conditions favoring the occurrence of boils are: an impoverished state of the blood, errors of diet and indigestion, overwork, dissipation, and certain diseases, as typhoid fever, diabetes, and smallpox. Boils are thought to occur more frequently in persons with rough skin and with a vigorous growth of dark hair. They may be situated on any part of the body, but certain localities are commonly attacked, as the scalp, the eyelids, cheeks, neck, armpits, back, and buttocks. Boys and young men are generally the sufferers.

**Treatment.**—The importance of cleanliness cannot be overestimated in the care of boils if we keep their cause in mind. Dirty underclothes or fingers used in squeezing or otherwise handling the boil, may carry the trouble to fresh parts. Any sort of local irritation should be removed; also all articles of clothing which have come in contact with the boils should not be worn until they have been washed in boiling water. In boils on the neck a soft collar should be worn. There is no single remedy of much value for the cure of boils, although taking a Fleischmann's yeast cake once daily, by crumbling and stirring it in water, is often a good means of arresting

the trouble. Also pills of calcium sulphid (each one-tenth grain) are commonly prescribed by physicians, every three hours.

The most rational measure consists in removing the general causes, as noted above, if this is possible. When the patient is thin and poorly nourished, food and cod-liver oil should be given; and if the lips and skin are pale, iron arsenate pills (one-sixteenth grain each) should be taken three times daily for several weeks.

The local treatment is by far the most important. A boil may sometimes be arrested by painting it with tincture of iodine until the boil is almost black, or with a very heavy coating of collodion. As soon as the boil softens in the middle a toothpick should be dipped in pure carbolic acid and thrust for one-quarter to one-half an inch into the center of the boil. This is but slightly painful and is wonderfully curative.

The boil should then be kept smeared with carbolized vaselin or the following ointment, and covered with sterile gauze held in place by bandage or strips of surgeon's adhesive plaster.

#### FORMULA FOR OINTMENT

Precipitated sulphur.....	1 drachm
Boric acid .....	1 drachm
Carbolized vaselin.....	1 ounce
Mix and apply externally.	

To prevent a crop of boils, the skin all about the boil should be washed with soap and water and then with a mixture of two parts alcohol and one part water. In boils on the neck this should be done over the neck and upper part of the back daily for some weeks after the last boil has disappeared.

Poultices are not advisable, as they favor the formation of new boils, but if very painful a boil may be covered by eight or ten layers of sterile gauze soaked in a saturated boric acid solution and covered with oil silk and bandage.

Unless the boil is far advanced before treatment is begun and contains a good deal of pus it is not necessary to use the knife. This is especially so if the carbolic acid has been used early. If the boil must be opened it should be thoroughly cleaned with hot water,



soap, alcohol; and a sharp knife, which has been boiled in water for five minutes, should be inserted, point first, into the center of the boil, far enough to liberate the pus and dead tissue. By this means healing is much more rapid than by nature's unassisted methods. In case boils keep recurring the best treatment consists in the injection of a vaccine made of killed pus germs.

Such treatment can only be given by a doctor. At the same time he will examine the urine to see if there is diabetes, because this disease often leads to the occurrence of boils.

### CARBUNCLES

A carbuncle is similar to a boil in its causation and structure but is usually a much more serious matter, having a tendency to spread laterally and involve the deeper layers of the skin. It differs from a boil in being much larger, in having a rounded or flat top instead of the conical shape of boils, and especially in having numerous, sieve-like openings, in the occurrence of death of the skin over the top of the carbuncle, and in being accompanied by intense pain and high fever.

It is commonly a disease of old persons, those prematurely old or debilitated or suffering from diabetes or Bright's disease, and occurs most frequently on the neck, back, or buttocks. It is particularly dangerous when attacking the back of the neck, upper lip, or abdomen.

**Symptoms.**—Carbuncle often begins with a chill and fever. It starts as a pimple, and rapidly increases in size, forming a hot, dusky red, rounded lump which may grow until it is from three to six inches in diameter. Occasionally it runs a mild course, remains small, and begins to discharge pus and dead tissue at the end of a week, and heals rapidly. More commonly the pain soon becomes intense, of a burning, throbbing character, and the carbuncle continues to enlarge for a week or ten days, when it softens and breaks open at various points discharging shreds of dead tissue and pus. The skin over the whole top of the carbuncle dies and sloughs away, leaving

an angry-looking excavation or craterlike ulcer. This slowly heals from the edges and bottom, so that the whole period of healing occupies from a week to two, or even six months.

The danger depends largely upon blood poisoning, and also upon pain, continuous fever, and exhaustion which follow it. Sweating and fever, higher at night, are the more prominent signs of blood poisoning.

**Treatment.**—Carbuncle demands the earliest treatment by a skilled surgeon, as it is only by the complete removal of the carbuncle, in the same way that one would remove the core of an apple, or, in more advanced cases the making of deep cross incisions into the carbuncle and cutting away all diseased tissue, that the best results are accomplished. However, when a surgeon cannot be obtained, the patient's strength should be sustained by feeding every two hours with beef tea, milk, and raw eggs, and with wine or alcoholic liquors. Three two-grain quinin pills and ten drops of the tincture of the chlorid of iron in water should be given three times daily.

The local treatment consists in applying large hot, fresh flaxseed poultices frequently, with the removal of all dead tissue with scissors previously boiled in water for ten minutes. When the pain is not unbearable, dressings made by soaking thick sheets of gauze or absorbent cotton in hot solution of corrosive sublimate (1 part to 5000 parts of water) should be applied and covered by oil silk or rubber cloth and bandage. They are far preferable to poultices, being better germ destroyers. When the dead tissue comes away and the carbuncle presents a red, raw surface, it should be washed twice a day in corrosive sublimate solution (1 part to 3000 parts of water), dusted with pure boric acid, and covered with clean, dry absorbent cotton and bandage.

## SNAKE BITES

**Various Species of Snakes.**—There are many different species of poisonous snakes in the United States. The more common are the rattlesnakes, the water moccasin, the copperhead, the harlequin and coral snake. These, and the venomous snakes of South America,

all belong to the rattlesnake family (Crotalinae), a subfamily of the viper family (Viperidae).

All our venomous snakes have certain characteristics by which they may be distinguished from their harmless brethren. The head is generally broad and flat and of a triangular shape, the wide, heavy jaws tapering to a point at the lips. There is a depression or pit on the upper lip, between the nostril and eye—hence the name “pit vipers” given to poisonous snakes. The pupil of the eye is long and vertical, of an oval or elliptical shape.

Venomous snakes are thicker in proportion to their length than harmless snakes, the surface of their bodies is rougher, and their tails are blunt or club-shaped. Conversely, harmless snakes possess long narrow heads, the pupils of their eyes are round, not vertical, slits, and their bodies are not thick for their length, but long and slim with pointed tails. The bite of vipers of all kinds is much more poisonous in tropical regions; in the North fatal snake bite is a rare occurrence.

In Cuba and Porto Rico there is a viper called Juba, or Boaquirá, which is a counterpart of the Northern rattlesnake, and the most poisonous of the many species in that region. Among venomous species of the Philippines are two boas and also a viper from nine to ten feet long, which rarely pursues and attacks man. This snake is easily killed by a blow on the neck. Another small viper with a club-shaped tail, inhabiting these islands, is nocturnal in its habits, and may get into boots at night. Boots, therefore, should always be inspected before one puts them on in the morning.

In South America are found the rattlesnake, in Brazil and North Argentina the bushmaster, in Venezuela, various species of the genus *Lachesis*, of which the fer de lance is best known, and is native to the West Indies as well. There are small poisonous vipers in different parts of Europe, and it is said that ten per cent. of persons bitten by them die. In India, China, and South Asia are the cobra, krait and poisonous vipers; in Africa the cobra and vipers; in Australia and Tasmania the copperhead, tiger snake, death adder, and brown and black venomous snakes—all of them members of the cobra family.



There are many poisonous lizards, although in the United States the only dangerous one is the gila monster.

The poisonous snakes are broadly divided into the colubrine and viperine groups, because of natural differences in their structure and effects of their poisons. Snake venom contains a number of poisonous substances (toxalbumins), some of which predominate in the viper family and others in the cobra group. Thus neurotoxin is the chief poisonous substance in the cobra venom and paralyzes the whole nervous system, especially that part sustaining the respiration. Other substances more particularly in the venom (hemorrhagin and hemolysin), of the rattlesnake family, favor internal bleeding, by destroying the walls of the blood vessels and making the blood more fluid or breaking up the red blood cells. These substances cause the discoloration of the skin, and perhaps gangrene of the bitten part, seen in rattlesnake bites. Such is the basis for the different groups of symptoms seen in the bites of viperines and colubrines.

If there is a doubt whether a snake is poisonous, the neck may be pressed down against the ground between the jaws of a forked stick and the poison fangs looked for without danger. These hang directly down from the front part of the upper jaw, or are thrust horizontally forward just in front of the upper lip, and may drip saliva and venom.

**Symptoms of Bites by Viperines** (*Rattlesnake Family*). — At first there is severe pain in the bite, which increases, together with swelling and purple discoloration. Besides there is great prostration, staggering gait, nausea or vomiting, cold sweats, rapid, feeble pulse, labored breathing, and perhaps drowsiness and stupor. Death may occur in this stage within twelve hours, or the swelling and discoloration may extend to the body, and symptoms of blood poisoning, with fever and great weakness, may ensue. If the patient survives this he may die weeks later from gangrene and infection in the bitten part. Recovery is more often rapid after a few hours and, in many sections of this country, death from rattlesnake bite is very rare. In Europe the effects of the viper bites are similar to the milder forms of rattlesnake bite.

**Symptoms of Bites by Colubrines** (*Cobra, Krait and Australian Venomous Snakes*). — The pain, swelling, and discoloration about



the bite are not so marked. But in half an hour or so after the accident the effects of the paralyzing substance (neurotoxin) become evident. The patient feels drowsy, acts as if intoxicated, and becomes so weak he cannot stand. There is a profuse flow of saliva and the tongue and throat are so paralyzed that the subject may not be able to speak or swallow. Then paralysis becomes general, the patient lies on his back unable to move, the breathing becomes slower and weaker and finally stops, with or without convulsions.

**Treatment.**—Tie a large cord, a bandage, or a strip of clothing, tightly about the limb. If the bite is in the leg, tie above the knee; if in the arm, tie above the elbow. This should be done at once. The cord should be tied tightly and then made still tighter by passing a stick under it and twisting it up.

Now the poison is kept from being absorbed into the general circulation. The next consideration is the getting rid of it. A sharp clean knife should be used to remove an oval piece of skin about two inches long and including the site of the bite. If an attendant or the patient are unable to accomplish this, a cut, running lengthwise with the limb and about half an inch deep, should be made directly through the bite and for an inch either side.

The tissues should then be squeezed all about the wound so as to promote the escape of blood and poison with it. The cord should be loosened about the limb at the end of fifteen minutes, and after two minutes it should be tightened again, and allowed to remain fifteen minutes longer. The wound should not be sucked. When the wound has bled freely it should be washed out with a solution of permanganate of potash (as much as water will dissolve).

One may inject permanganate of potash with a hypodermic syringe, a whole syringe of a solution (grains 5 to 1 ounce of water) in two or three places as near the exact site of the bite as possible. The best way consists in cutting out the area containing the bite and then washing with the permanganate solution but, when one has not the nerve to do this, the next best treatment is to cut deep into the wound, encourage bleeding, and then inject the permanganate (with the hypodermic syringe) and wash out the wound with it also.

Three teaspoonfuls of whisky with the same amount of water should be given every thirty minutes, and injections with a hypodermic syringe of one-thirtieth of a grain of strychnin sulphate should be made every thirty minutes, for three or four doses, if the pulse is weak. Giving large amounts of whisky is harmful and also walking the patient around if drowsy—his strength should be saved.

In addition one may inject a serum for snake bite; in order to be efficient one should use a different serum for every variety of snake. There is an antivenin made by Flexner and Noguchi which is most valuable in rattlesnake bite. The whole amount supplied should be injected into a vein and at once after the bite, before symptoms are manifest, to secure the best result.

There is no serum which is efficient in the treatment of bites of all kinds of snakes. The serum used is that of horses which have received increasing doses of snake venom until an antitoxin is formed in their blood. If cobra venom is injected then the horse serum contains an antitoxin against this snake, but not against rattlesnake poison. It has not been found possible to inject venoms of all the poisonous snakes into a horse and to secure a serum which will also antagonize all.

Usually it is only the young, old, and weak who succumb to snake bites.

### **RABIES—HYDROPHOBIA**

Bites of animals should be treated like punctured wounds, unless there is danger of hydrophobia. There is no danger of hydrophobia from the bite of an animal unless it is affected with rabies.

Rabies in animals is the same disease as hydrophobia in man. Rabies is due to a special germ which is transmitted from the saliva of the rabid dog to other animals or man by biting.

Many writers have tried to prove that hydrophobia is an imaginary disease, but the disease is quite common in dogs and as well recognized in man or animals as any disease known, and is invariably fatal in either.

**Symptoms of Rabies.**—After a dog is bitten, several days or

months—twenty-five days on the average—elapse before the disease manifests itself. Then the disposition of the animal is altered; he licks and swallows all kinds of objects and often vomits. After a few days the animal is apt to leave home and travel great distances, biting everything in his way, and may return home to die. The voice is hoarse, the tail droops and the head is depressed, with staring, glazed, bloodshot eyes; the animal is insensible to pain, persons, or surroundings; the gait is unsteady and the animal becomes emaciated and repulsive. In the last stage, and sometimes at the beginning, there is a paralysis of the lower jaw and perhaps of the hind limbs; the lower jaw drops, the tongue is dry, and covered with stringy mucus and the animal can neither swallow, howl nor bite. Death is invariable, usually in four days. The animal has no fear of water at any time, but in the later stages he tries to swallow water but cannot, on account of paralysis of the throat, and for this reason he may appear to have a bone in his throat.

When a person is bitten it is imperative to know whether the biting animal was mad (rabid). Therefore, the animal should be kept alive and shut up so that he can be watched; if he is alive and well after two weeks he has not rabies. If a suspected mad animal has been killed or dies, a correct diagnosis can usually be made in the laboratory, so that it is important that the body always be sent to a trained pathologist.

**Treatment in Man.**—If there is doubt whether an animal has rabies, and he has bitten persons or animals and has been killed or run away and the body cannot be examined by a trained pathologist, the bitten person should always take the Pasteur treatment. This may now be given by any doctor, is comparatively harmless and will surely prevent rabies when taken within a week or so after receiving the bite. In man the disease develops usually in about thirty days after the bite, but this period may vary from fifteen days to six or more months.

If the bite is on a limb tie tightly a cord, bandage, or piece of clothing about the bitten limb above the knee or elbow, and twist it tighter with a stick. If the wound is large enough, wash out with water and a syringe and then dip a stick into pure carbolic acid or

tincture of iodin and swab the wound with it, or cauterize the wound by thrusting a red hot nail or poker into it. Better still, cut out the flesh, including the bite, with a sharp knife. One should naturally have good reason to suspect the biting animal was actually mad before adopting such caustic methods. Finally, if there is any doubt concerning the madness of an animal who has bitten a person the latter should always have the Pasteur treatment. The percentage of persons not receiving the Pasteur treatment who develop hydrophobia after being bitten by rabid animals varies greatly (average said to be fourteen per cent.) with the site of the bite. Bites on unclothed parts of the body are much more dangerous.



## CHAPTER IX

### SKIN DISEASES—BITES AND STINGS OF INSECTS

Itching. Chafing. Hives. Pimples. Blackheads. Cold Sore. Prickly Heat. Ringworm. Freckles. Tan. Ivy poison. Warts. Baldness. The itch. Callus and Cracks. Eczema. Erysipelas. Bites of Mosquitoes, bees, wasps, hornets, wood ticks, lice, fleas, bed bugs, flies, scorpions, centipedes, spiders.

### SKIN DISEASES

No attempt will be made to give an extended account of skin diseases, but a few of the more common disorders which can be readily recognized by the layman will be given special attention. Although these cutaneous troubles are often of so trivial a nature that a physician's assistance is unsought, yet the annoyance is sufficient to make it worth while for the patient to inform himself about the ailment. Then the affections are so frequent that they may occur where it is impossible to procure medical aid. Whenever an eruption of the skin is accompanied by fever, sore throat, headache, pains in back and limbs, vomiting, or general illness, one of the serious, contagious, eruptive diseases should be suspected, particularly in children, and the patient must be removed from contact with others, kept in isolation, and a physician immediately summoned.

#### ITCHING

(*Pruritis*)

Itching is not a distinct disease by itself, but a symptom or sign of other skin or general disorders. Occasionally it must be treated as if it were a separate disease, as when it occurs about the entrance to

the bowel (anus), or to the external female sexual parts (vulva), or attacks the skin generally, and is not accompanied by any skin eruption except that caused by scratching, the cause being unascertainable.

**Causes.**—Itching, without apparent cause, may be due to parasites, as lice and fleas—and this must always be kept in mind, although debilitated states of the body and certain diseases, as gout and diabetes, are sometimes the source. Commonly, itching is caused by one of the many recognized skin diseases, and is accompanied by an eruption characteristic of the particular disorder existing; special treatment by an expert, directed to remedy this condition, is the only reasonable way to relieve the itching and cure the trouble.

**Treatment.**—It may not, however, be improper to suggest means to relieve such a source of suffering as is itching, although unscientific, with the clear understanding that a cure cannot always be expected, but relief may be obtained until proper medical advice can be secured. The treatment to be given will be appropriate for itching due to any cause, with or without existing eruption on the skin, unless otherwise specified. If one remedy is unsuccessful, try others.

For itching afflicting a considerable portion of the skin, baths are peculiarly effective. Cold shower baths twice daily, or swimming in cold water at the proper time of year, may be tried, but tepid or lukewarm baths are generally more effective. The addition of saleratus or baking soda, one to two pounds to the bath, is valuable, or bran water obtained by boiling bran tied in a bag in water, and adding the resulting solution to the bath. Even more efficient is a bath made by dissolving half a cupful of boiled starch and one tablespoonful of washing or baking soda in four gallons of warm water. The tepid baths should be as prolonged as possible, without chilling the patient. The bran water, or starch water, may be put in a basin and sopped on the patient with a soft linen or cotton cloth and allowed to evaporate from the skin, without rubbing, but while the skin is still moist a powder composed of boric acid, one part, and pulverized starch, four parts, should be dusted on the itching area.

Household remedies of value include saleratus or baking soda (one teaspoonful to the pint of cold water), or equal parts of alcohol or vinegar and water, which are used to bathe the itching parts and

permitted to dry on them. Calamin lotion is also a serviceable preparation when there is redness and swelling of the skin.

When the itching is confined to small areas, or due to a pimply or scaly eruption on the skin, the following ointments may be tried: a mixture of tar ointment and zinc ointment (two drachms each), with four drachms of cold cream; or flowers of sulphur, one part, and lard, twelve parts, or resinol ointment.

### CHAFING AND CHAPPING

Chafing occurs when two opposing skin surfaces rub together and are irritated by sweat, as in the armpits, under the breasts, and beneath overlapping parts of the belly of fat people, and between the thighs and buttocks. The same result is caused by the irritation induced by discharges constantly running over the skin, as that seen in infants, due to the presence of urine and bowel discharges, and that irritation which arises from saliva when the lips are frequently licked. The latter condition of the lips is commonly called chapping, but it is proper to consider chafing and chapping together as the morbid state of the skin, and the treatment is the same in both.

Chafing occurs more often in hot weather and after violent exercise, as rowing, riding, or running, and is aggravated by the friction of clothing or of tight boots. It may, on the other hand, appear in persons who sit a great deal, owing to constant pressure and friction in one place. The parts are hot, red, and tender, and emit a disagreeable odor when secretions are retained. The skin becomes sodden by retained sweat, and may crack and bleed. The same redness and tenderness are seen in chapping of the face and lips, and cracking of the lips is frequent.

**Treatment.**—In chafing, the first requisite is to remove the cause, and then thoroughly wash the part with soap and water. Then a saturated solution of boric acid in water should be applied with a soft cloth, and the parts dusted with a mixture of boric acid and powdered starch, equal parts, three times daily; or calamin lotion is an excellent preparation.

If the lips are cracked, painting the cracks with compound tincture of benzoin three times daily, with a camel's-hair brush, will be



found curative. Chapping of the lips is prevented by the use of cold cream.

### HIVES—NETTLERASH

(*Urticaria*)

**Symptoms.**—Hives is characterized by the sudden appearance of hard round or oval lumps in the skin, from the size of a flattened pea to (rarely) that of a silver dollar, of a pink or white color, or white in the center, and surrounded by a red blush. The rash is accompanied by much itching, burning, or tingling, especially at night when the clothes are removed. The peculiarity of this eruption is the suddenness with which the rash appears and disappears; the itching, the whitish or red lumps, the fact that the eruption affects any part of the body and does not run together, are also characteristic. Scratching of the skin often brings out the lumps in a few minutes. The swellings may last a few minutes or hours, and suddenly disappear to reappear in some other place. The whole trouble usually continues only a few days, although at times it becomes a chronic affection.

Scratching alters the character of the eruption, and causes red, raw marks and crusts, but the ordinary swellings can be seen usually in some part of the body. Rarely, the eruption comes in the throat and leads to sudden and sometimes dangerous swellings, so that suffocation has ensued. Fever, sore throat, backache, and headache, which are common in the contagious eruptive disorders, as measles, scarlet fever, etc., are not present with hives.

**Causes.**—Indigestion is the most frequent cause. Certain articles of diet are almost sure to bring on an attack of hives in susceptible persons; these include shellfish, clams, lobsters, crabs, rarely oysters; also oatmeal, buckwheat cakes, cheese, pork, sausages, pickles, and mushrooms; acid fruits, particularly strawberries, but sometimes raspberries and peaches. Nettlerash is common in children, and may follow any local irritation of the skin caused by rough clothes, bites of mosquitoes and fleas, and the stings of jellyfish, Portuguese man-of-war, and nettles. Nettlerash is also favored by certain disorders as gout, rheumatism, malaria, and is common in pregnancy.



**Treatment.**—Remove any source of irritation in the digestive canal, or externally, and employ a simple diet for a few days, as bread and milk.

A heaping tablespoonful of Epsom salts in a whole glass of water before breakfast is suitable for an adult, or any other active cathartic may be taken. For children a half to a teaspoonful of aromatic fluid-extract of cascara sagrada is a pleasant and active cathartic, but in severe cases from two to four teaspoonfuls of castor oil are more effective.

Locally we use, as domestic remedies, a saturated solution of baking soda (or saleratus) in water, or equal parts of alcohol or vinegar and water to relieve the itching. The bath containing soda and starch (*see* Itching) is the most useful treatment when the nettlerash is general. The following lotion is one of the best applications which can be employed for this disorder. It should be sopped on frequently with a soft cloth and allowed to dry on the skin.

#### FORMULA FOR LOTION

Acid carbolic.....	1 drachm
Glycerin .....	1 drachm
Alcohol .....	1 ounce
Water .....	7 ounces
Mix and apply externally to relieve itching.	

#### PIMPLES—BLACKHEADS

(*Acne*)

**PIMPLES.**—This eruption is situated chiefly on the face, but often on the back, shoulders, and chest as well. It is a disorder which is seen mostly in young men and women at about the age of puberty.

It consists of conical elevations of the skin, from a pinhead to a pea in size, often reddened and tender on pressure and having a tendency to form matter or pus, as shown by a yellow spot in the center of the pimple. After three to ten days the matter is discharged, but red elevations remain, which later become brown and disappear, except in rare cases, without scarring.

**BLACKHEADS.**—Blackheads appear as slightly elevated black

points no bigger than the head or point of a pin, sometimes having a yellowish tint from which a little, thin, wormlike mass may be pressed. Pimples and blackheads are both due to inflammation about the glands of the skin which secrete oily material; the mouths of the glands become plugged, thus retaining the oily secretion and causing blackheads.

**Causes.**—The true cause of the skin inflammation or acne is uncertain. It may be the result of an irritant eliminated by the skin from the blood. It is more commonly believed to be due to a special germ found in the pores of the skin. Then as the glands also are invaded by the germs producing pus, we have a pimple, which usually results in the formation of matter as described above. Constipation and indigestion favor the occurrence of pimples and blackheads; also a poor state of the blood, or anemia.

**Treatment.**—Tea, coffee, tobacco, beer, and alcohol should be avoided, together with sweets, pastry, cake, veal, pork, fats, and cheese. The diet should be simple, consisting of cereals (except oatmeal) with eggs, bread and butter, and fruit for breakfast and lunch, and at dinner, meat or white fish, vegetables, lettuce salad with French dressing and fruit or simple pudding. A cup of hot water should be taken before meals, and a glass of cold water at meals and two hours after, and at bedtime. At least one hour daily of outdoor exercise is requisite in games, riding, bicycling, or walking.

A daily bath followed by vigorous friction with a rough towel is important in all cases to stimulate the skin. The bowels must be moved daily by some proper cathartic, as cascara tablets containing two grains each of the extract. The dose is one to two tablets at night.

The blackheads should be squeezed out with a watch key, or with an instrument made for the purpose—not finger nails—and pimples containing matter must be emptied after being pricked with a needle (which has been passed through a flame to kill germs on it). If the inflammation is not marked one should thoroughly massage the skin of the forehead, nose and cheeks, pinching it so as to squeeze out the contents of the pores. This should be done at bedtime. Then bathe the face well with hot water and apply the following lotion:—

Precipitated sulphur.....	1	drachm
Zinc sulphate.....	1	“
Sulphuretted potassium.....	1	“
Water .....	4	ounces

Mix, shake, and apply to skin.

If there is redness of the skin and irritation associated with pimples, it is sufficient to bathe the skin with very hot water and green soap three times daily, and apply calamin lotion at night. In other cases, when the skin is not sensitive, and zinc or mercury has not been used, the employment of sulphur soap and hot water at bedtime, allowing the suds to dry and remain on the face during the night, is recommended. An ointment consisting of one-half dram of precipitated sulphur with one-half ounce each of powdered starch and vaselin applied each night, and hot water used on the face three times daily are also efficacious.

Among recent treatments that with vaccine, made of the killed germs responsible for the trouble, is sometimes very successful, especially when pus formation is frequent. The specialist also sometimes finds the x-ray of value. The disease requires a long time for cure but commonly disappears after early adult life.

The services of a specialist are almost always required to obtain good results, and even then much perseverance is needed by both doctor and patient.

### COLD SORE—FEVER BLISTER

(*Herpes*)

Cold sores occur usually about the lips or at the angles of the mouth, although they may appear anywhere on the face.

Cold sore has a round, oval, or irregular outline from the size of a pea to that of a quarter of a dollar, and is seen as a slightly raised patch on the skin on which is a group of very minute blisters, three to twelve in number. Cold sore may be single or multiple, and near together or widely separated on the face. Having first the appearance of a red patch, it later becomes covered with a brown crust from the drying of the contents of the tiny blisters. Cold sore often gives rise to burning, itching, or tingling, the disfigurement usually caus-

ing more annoyance, however, than pain. The duration of the trouble is from four to twelve days.

**Causes.**—Cold sores are commonly induced by indigestion and fevers, and also are occasioned by local irritation of any sort, as from nasal discharge accompanying cold in the head (from which the name is derived), by the irritation produced by a pipestem or cigar, and by rubbing the skin. They are usually caused by the germ of pneumonia. Fever blisters often appear in women about the time of menstruation. They also are common from exposure to the sun, especially on the water.

**Treatment.**—Picking and scratching are very harmful, and cigar or pipe smoking must be stopped. Apply spirit of camphor frequently, and also if there is much itching or burning, sop the eruption with calamin lotion; this will relieve the discomfort.

#### FORMULA FOR CALAMIN LOTION

Zinc oxid .....	1 drachm
Calamin .....	1 drachm
Glycerin .....	$\frac{1}{2}$ ounce
Lime water .....	1 ounce
Rose water.....	$2\frac{1}{2}$ ounces
Mix and apply externally.	
Shake before using.	

When the trouble occurs at the corners of the mouth or when there is any cracking of the lips, painting the parts with compound tincture of benzoin three times daily is advisable.

#### PRICKLY HEAT

(*Miliaria*)

This is a common eruption of adults in hot weather, and very frequently attacks children.

**Symptoms.**—It consists of a fine, pointed, red rash, or minute blisters, and occurs on parts of the body covered by clothing, more often on the chest. The eruption is caused by much sweating, leading to congestion and swelling of the sweat glands. Burning, stinging and itching accompany the disorder.



The condition must be distinguished from the contagious skin eruptions. In the latter there are fever, sore throat, backache, headache, and general sickness, while in prickly heat there is no general disturbance of the system, or fever, unless the eruption comes out in the course of fevers, when it is of no significance except as one of the symptoms of fever.

**Treatment.**—The treatment of prickly heat, occurring in hot weather, consists in avoiding heat as much as possible, the wearing of light clothing day and night, and sponging the surface with cold water, and then dusting it with some simple powder, as starch or flour, or better, borated talcum. To relieve the itching, sponging with limewater or a saturated solution of baking soda (as much as will dissolve in water), or bran baths, made by tying one pound of bran in a towel which is allowed to soak in the bath, are all good remedies. The use of a toilet talcum powder over the skin after one of these preparations is also advisable.

#### RINGWORM OF THE BODY—RINGWORM OF THE SCALP

**Causes.**—This skin disease is caused by a vegetable fungus and not by a worm as the name suggests. The disease on the body and scalp is caused by the same parasite, but ringworm of the body may attack adults as well as children, and is readily cured; ringworm of the scalp is a disease confined to children, and is difficult of cure.

Ringworm is contagious and may be acquired from children with the disease, and therefore patients suffering from it should not be sent to school, and should wear a skull cap and have brush, comb, towels, and wash cloths reserved for their personal use. Children frequently contract the disease from fondling and handling cats and dogs.

**Symptoms.**—On the body, ringworm attacks the face, neck, and hands. It appears first as small, red, scaly spots which may spread into an irregularly circular patch as large as a dollar with a red ring of small, scaly pimples on the outside, while the center exhibits healthy skin, or sometimes is red and thickened. There may be several patches of ringworm near each other and they may run together, or there may be only one patch of the disease. Ringworm of the

scalp occurs as a circular, scaly, partially bald patch from the size of a nickel to that of a silver dollar, of a dusty-gray or pale-red color on which there are stubs of broken hairs with split ends pointing in different directions, and readily broken off in the attempt to pull them out. The disease in this locality is very resistant to treatment.

Ringworm is distinguished from eczema of the scalp in that in eczema there is more itching and the patches are not so circular and do not have the broken hairs seen in ringworm. There are not the crusts in ringworm seen in eczema.

**Treatment.**—The application of pure tincture of iodine or corrosive sublimate (three grains to an ounce of water) to the spots with a camel's hair brush, once daily for three days, will usually cure ringworm on the skin. On the scalp the hairs should be pulled out of the patch of ringworm, and each day it should be washed with soap and water and a solution of boric acid (as much acid as the water can dissolve), destroying the cloth used for washing. Sulphur ointment is then applied (sulphur one part, and lard seven parts).

It is desirable to secure the services of a physician in this disease, in which various remedies may have to be tried to secure recovery, which is at best usually a matter of several months.

#### **FRECKLES, TAN AND OTHER DISCOLORATIONS OF THE SKIN**

Freckles appear as small, yellowish-brown spots on the face, arms, and hands, following exposure to the sun in summer, and generally fading away almost completely in winter. However, sometimes they do not disappear in winter, and do occur on parts of the body covered by clothing. Freckles are commonly seen in red-haired persons, rarely in brunettes, and never on the newborn. Their removal is accomplished by the employment of agents which cause a flaking off of the superficial layer of discolored skin, but after a few weeks the discolorations are apt to return.

Large, brown spots of discoloration appearing on the face, or liver spots (chloasma), are observed more often in women, and are due to disorder of the digestive organs, of the sexual organs or to pregnancy; they also occur in persons afflicted with exhausting diseases.

Tan, freckles, and discolorations of the skin generally are benefited by the same remedies.

**Treatment.**—Prevention of tan and freckles is secured through non-exposure of the unprotected skin to the sun, though it is doubtful whether the end gained is worth the sacrifice, if carried so far as avoidance of the open air and sunlight whenever possible. The wearing of a veil and protecting the skin with an application of calamin lotion before exposing the face, will also prevent freckles and tan.

Pure hydrogen dioxid applied several times daily to the skin is harmless and may remove freckles and discolorations. The dark patches, or liver spots, on the face of women are best treated by attention to any existing disease of the womb or ovaries.

The following lotion is efficacious:

Zinc oxid .....	30 grains
Powdered starch .....	30 “
Kaolin .....	60 “
Glycerin .....	2 drachms
Rose water.....	2 ounces

Mix.

Directions.—Shake and paint on spots, and allow the preparation to dry; wash it off before each fresh application.

It is best to use only cold water, rarely soap, on the healthy skin of the face. Warm water favors relaxation of the skin and formation of wrinkles.

#### IVY POISON

The poison ivy (*Rhus toxicodendron*), poison sumach (*Rhus venenata*), and poison oak (*Rhus diversiloba* of the Pacific Coast, U. S. A.), cause inflammation of the skin in certain persons who touch any one of these plants, or in some cases even if approaching within a short distance of them. The plants contain a poisonous oil, and the pollen blown from them by the wind may thus convey enough of this oil to poison susceptible individuals who are even a considerable distance away. Trouble begins within four or five hours, or in as many days after exposure to the plants.

**Symptoms.**—The skin of the hands becomes red, swollen, painful,

and itching. Soon little blisters form, and scratching breaks them open so that the parts are moist and then become covered with crusts. The poison is conveyed by the hands to the face and, in men, to the sexual organs, so that these parts soon partake of the same trouble. The face and head may become so swollen that the patient is almost unrecognizable.

There is a common belief that ivy poison recurs at about the same time each year, but this is not so except in case of new exposures. Different eruptions on the same parts often follow ivy poisoning, however.

**Treatment.**—A thorough washing with soap, especially green soap, will remove much of the poison and after effects. Saleratus or baking soda (a heaping tablespoonful to one pint of cold water), or lime water may be used. The best treatment consists in soaking several layers of soft cotton or linen cloth or gauze in one of these solutions, or better in calamin lotion, and keeping the application wet on the part day and night. On the arms and hands the application can be kept wet by covering it with oil silk or rubber cloth and bandage. On the face the wet application may be removed at night and cold cream or zinc ointment may be used.

## WARTS

(*Verruca*)

Warts are flattened or rounded outgrowths from the outer and middle layers of the skin, varying in size from a pin head to half an inch in diameter. There are several varieties. The common wart occurs more often on the hands of children or young people and may be of various colors—yellow, brown, black, or green. They may be numerous, single, or in groups.

**SEED WARTS.**—These have numerous, little, fleshy projections over their surface, which are enlarged normal structures (papillae) of the middle layer of the skin, together with the thickened, outer, horny layer.

**THREADLIKE WARTS.**—These are seen along the edge of the nails, on the face, neck, eyelids, and ears. They are formed by the great



prolongation and growth of the projections, or papillae of the middle layer of the skin just described.

**FLAT WARTS.**—In young persons they occur on the face and backs of the hands. In old persons they are seen on the body and arms, and are dark.

**MOIST WARTS.**—Moist warts occur where they are softened by secretions of the body, as about the sexual organs (in connection with diseases of the same), and about the anus (or opening of the bowel), in the armpit, under the breast in women, and between the toes. They are of a white, pink, or red color, and consist of numerous, little fleshy projections, usually covered with a foul-smelling secretion.

**Causes.**—Warts appear to be slightly contagious, for persons have occasionally acquired warts by handling them on other individuals, and a crop of warts may develop from a single one. They may disappear quickly or remain indefinitely.

**Treatment.**—The most rapid method of removing warts is by stretching the skin and scraping them off with a sharp spoon under cocain; this is not applicable when there are large numbers of warts or unless done by a physician. A slower method is by painting the warts three times daily with a mixture of one drachm of salicylic acid in four drachms of collodion. Every few days the collodion should be pulled off and the softened surface removed by rubbing the warts with sandpaper or pumice stone—after soaking them in hot water.

When warts are very numerous they may be removed by bathing them twice daily in a saturated alcoholic solution of salicylic acid and scraping off the soft parts, as described. The application of pure carbolic, acetic or lactic acid to single warts, by means of a toothpick twice daily, may be efficient. The small thread or taglike warts on the neck may be cut off by curved scissors, which have lain in alcohol five minutes, and the remaining raw spot touched with a pencil of silver nitrate. The moist warts should be kept absolutely clean by soap and water and then powdered alum may be dusted over the skin. The use of the electric needle or freezing, in the hands of specialists, have proven successful in removing warts. Warts may sometimes be removed by painting them frequently with the fresh juice of the milkweed.

**BALDNESS**

Baldness is commonly classed in three groups:

1. The first group includes about three-quarters of all cases of baldness and is due to dandruff or, more precisely, the skin disease which causes dandruff. This is usually an inflammation (seborrhea) affecting chiefly the glands supplying oil to the hair, and after a time the trouble extends to the hair roots, so that the hair gets dry and fine, and later falls out.

Dandruff is composed of yellowish, greasy plates, or crusts, or dry, thin scales. The disorder is supposed to be due to a parasite, and to be somewhat contagious, so that persons having dandruff should not use the brush or combs of others. Dandruff is usually present for many years (two to seven) before the hair begins to fall, but as the baldness increases the dandruff decreases.

2. In another smaller group of cases the baldness is said to be premature, that is, it appears early, without any disease of the skin, and is apparently an inheritance.

3. Finally, there is the form of baldness seen in children or adults in which bald spots suddenly make their appearance in the midst of a thick crop of hair. Sometimes neuralgic pains are felt in the head for days previously. The cause is unknown; the disease may be parasitic and slightly contagious, or due to some nervous disturbance. It tends to recovery without treatment within several months to years, although a return of the trouble is common. Baldness is frequently due to syphilis, when it may be cured by antisiphilitic remedies. Complete baldness, so common in men, is rarely seen in women.

**Treatment.**—To prevent premature baldness proper care of the hair must be pursued from birth. The baby's head should be washed daily and then anointed with vaselin until the hair begins to grow, when a soft brush may be used and the vaselin dispensed with. The child's hair should not be cut short, and after the eighth or ninth year a girl's hair should be allowed to grow. Daily wetting of the hair, to make it part or lie smooth, is harmful. Shampooing may be done with any good toilet soap once in two or three weeks. The

most efficient preventive of baldness is long and careful brushing, several times daily, with a brush having long, fairly stiff bristles but not so stiff as to make the scalp sore. Tightly fitting hats are injurious. Daily massage of the scalp, so that the skin is picked up in folds, is of great value. Also exercise and improvement of the general health are most important.

When premature baldness is beginning the following ointment should be rubbed well into the scalp daily. Thorough brushing, attention to the general health and massage of the scalp are of chief value, however.

#### FORMULA FOR OINTMENT

Pilocarpine hydrochlorid .....	30 grains
Vaselin .....	5 drachms
Oil of lavender .....	25 drops
Lanolin .....	2 ounces
External use (Lassar).	

In the baldness beginning with dandruff it is wiser to treat the disease causing the dandruff (seborrhea) before the hair falls out. The head should be shampooed with soap and water (tar soap is useful) and when dry the scalp (not the hair) should be anointed with sulphur ointment (1 drachm of precipitated sulphur in 1 ounce of cold cream) every night; once a week the head should be washed.

After daily application of the sulphur ointment for a week the ointment may be applied but every other night the second week, and twice the third week, and once the fourth week, at which time the dandruff should be cured.

If baldness is beginning the sulphur ointment must be applied daily for several months; when there is absolute baldness it is probable that no remedy will make the hair grow again. While women suffer from this disease with dandruff they do not become absolutely bald as a result of it, as men do.

#### THE ITCH

(*Scabies*)

**Causes.**—This disease is caused by the burrows of an insect or mite under the skin in special regions, as between the fingers, under



surface of the wrists, about the navel, breasts, and privates of men.

**Symptoms.**—At these places there will be seen scratch marks and often little blisters, pimples, and red patches. Itching is very great, especially at night, and when it begins there is no skin eruption visible. The presence of intense itching and scratch marks at the places noted, particularly if more than one member of a family is affected, is usually sufficient to make a diagnosis.

**Treatment.**—After the patient takes a thorough soap and water bath and is dry he should rub all affected places with sulphur ointment night and morning for three days, while wearing the same underclothes, nightclothes and sheets. Then he may take another bath and use clean clothes, dusting sulphur over the body and between the sheets for a week, at bedtime. The soiled body clothing and bed clothing should be boiled. In children a mixture of Peruvian balsam and sweet oil, equal parts, may be used instead of sulphur ointment.

#### CALLUS AND CRACKS OF THE SKIN

**Symptoms.**—Callus consists of round or irregular, flattened, yellowish thickenings of the upper or horny layer of the skin. The skin becomes hypertrophied and resembles a thick, horny layer caused by intermittent pressure of tools, shoes, etc. The whole palm of the hand or soles of the feet may be the seat of a continuous callus.

Callus is not harmful, except in leading to cracks of the skin near the bend of joints, and, rarely, in causing irritation, heat, pain, and even the formation of pus in the skin beneath. Callus usually disappears when the exciting cause or pressure is removed.

**Treatment.**—The hands and feet should be soaked continuously in hot baths containing washing soda, and then should be covered with diachylon, or other ointment. This may be done each night; or colodion (one ounce containing sixty grains of salicylic acid) may be painted on the callus, night and morning for several days, and then, after soaking for some time in hot water, the surface should be scraped off with a dull knife and the process repeated as often as necessary to effect a cure.

Fissure or cracks of the skin caused by callus are treated by prolonged soaking in hot water, paring away the edges so as to diminish



the depth of the crack, and then applying compound tincture of benzoin with a camel's hair brush to the crack twice daily, and cold cream to the skin at bedtime. Inflammation about callus must be cared for as recommended for inflamed corns.

### ECZEMA

(*Salt Rheum—Tetter*)

Ec'zema (not ec-ze'ma) is very common, constituting one-third of all skin diseases.

**Causes.**—It is not contagious but is due to some external or internal irritant in persons whose skin is unusually sensitive. Certain disorders favor its occurrence, as indigestion, constipation, anemia, Bright's disease, diabetes, uterine troubles, rheumatism, gout, and nervous diseases. Among external irritants causing eczema are included the action of the sun, wind, hot and cold weather, cold water, external heat, chemicals, injuries, chafing, parasites and varicose veins.

Eczema is a form of catarrh of the skin, in that there is usually, but not always, moisture secreted at some period of the disease. The skin at times may be merely swollen and red, itchy and dry throughout the whole course of eczema. But moisture in an itching skin disease is almost always a sign of eczema.

**Symptoms.**—There are seven prominent symptoms of eczema. These are redness, itching, swelling, moisture, crusting, scaling, and cracking. The disease occurs in spots which soon spread into patches. The occurrence of patches in a skin disease is another sign suggestive of eczema; still another one usually present at some time in eczema is the appearance of minute blisters the size of a pin head. These in rupturing give rise to the moisture, which is sticky and gluey.

The disease often attacks the face and scalp, the folds of the joints and the limbs. The disease may be shortlived or last for years; frequent return of the trouble is to be looked for.

**Various Forms.**—Five forms of the disease are usually described. These, however, frequently run into each other. Thus the disease may begin with a crop of red, itchy pimples, then blisters may form on the pimples; these may break and form a red moist patch, or

matter may form in the blisters; and finally recovery occurs with crusting or scaling.

The common forms are as follows:

1. In this form there are swelling and redness of the skin with burning and itching (erythematous); the face, neck, hands, and buttocks are favorite sites. Small spots may run together and form patches. The patch may not be moist unless from scratching. The duration of the disease may be short or become chronic. Recovery occurs with the disappearance of redness and swelling and the appearance of branny scales.

2. This is the pimply and most itchy form (papular). There is an eruption of dull red pimples of a pin-head size, which frequently form patches as large as a silver dollar. These occur on the back, arms, hands and legs. They may become capped with minute blisters which give rise to moist patches when they are broken by scratching.

3. The most common form of all is that in which there are great numbers of little pin-point sized blisters on a raw, red surface (vesicular). This occurs more often on the face, hands, neck, and buttocks. There is intense burning and itching, the secretion is thick and sticky, and forms crusts in drying. When the crusts are removed the surface beneath is raw. The blisters are present such a short time that they may not be seen. Finally, the redness disappears, the swelling subsides, and scaling heralds recovery.

4. Matter or pus may form in the blisters and this variety (pus-tular) often attacks the face or scalp in children. Pus germs are commonly inoculated into the skin through scratching, and the secretion in drying produces thick, yellowish or greenish crusts. The burning and itching are not so marked as in the other forms of eczema.

5. The form of eczema in which the skin is dry, red, covered with scales, like dandruff, may be chronic with thickened skin which cracks readily, or it may simply be the final stage of any variety of eczema preceding recovery.

Eczema may be general and give rise to serious symptoms or be confined to a small patch. Being prone to recur when apparently cured it is impossible to forecast the future in any given case. When

the disease becomes chronic recovery is a slow matter. Eczema never threatens life, however, and practically all cases can be cured; the only uncertainty is whether there will be a return of the trouble.

**Treatment.**—The treatment of eczema is a puzzling matter for physicians, and only specialists in skin diseases can handle cases to best advantage as the remedies have often to be varied from time to time to suit the changing conditions of the skin. The diagnosis in some of its forms is also a difficult matter. Only some general suggestions can therefore be made for the home management of eczema.

In general the diet should contain but little meat in cases of eczema. In acute cases the diet for the first few days should be confined to milk (2 quarts), cereals and bread or toast. Patients should drink at least nine glasses of water daily, one before and at each meal, and one between meals and at bedtime. Alcohol in all forms, and tea and coffee, should be excluded from the diet. In ordinary cases of subacute and chronic eczema a simple diet chiefly of cereals, vegetables and fruit, with meat once daily, and plenty of water are advised.

The bowels should be kept regular by diet and exercise, if possible, but if this is not successful some of the drugs recommended in this volume may be used. No special remedy taken internally is of much use in eczema unless the system particularly demands it—as iron in anemia, and cod-liver oil in the thin and undernourished.

**Local Treatment.**—Neither soap nor water must be used in eczema. The eruption should be cleaned by wiping with oil instead. Scratching is injurious and must be prevented. In children the hands may be enclosed in Canton flannel bags, or the sleeves pinned to the clothes in infants; or, if on the face, the child may wear a muslin mask with holes cut for the eyes, mouth and nose. If there are crusts on the skin they must be removed by soaking over night in sweet oil before applying other remedies.

In the treatment of eczema by drugs we should use soothing remedies in the stage with great redness, swelling and burning. In the form with less redness and swelling, but with moisture, pimples, crusts, and itching, agents drying up the skin are advisable—as the



zinc preparations. Finally, in chronic eczema, or when the other remedies do not cure, some of the tar compounds are most valuable in stimulating the skin, and so favoring recovery as well as relieving the itching.

In the beginning of eczema, when there is most swelling, redness, burning and itching, sopping the skin frequently with a solution, consisting of two heaping teaspoonfuls of boric acid or baking soda to one pint of water, and then powdering it with cornstarch flour and covering with old cotton or linen and bandage, is effective. Calamin lotion, as previously described, is also an excellent preparation when sopped on with a piece of old soft muslin several times a day. If the itching is not relieved by this, ten to twenty drops of pure carbolic acid may be added to four ounces of calamin lotion.

After the disease has lasted some days and the redness and swelling have somewhat departed, or in the form where there is moisture, crusts, blisters, or pimples, one of the drying preparations is desirable. Zinc ointment is the simplest. Lassar's paste is sometimes more effective, as follows:

Zinc oxid .....	2	drachms
Starch .....	2	"
Vaselin .....	4	"
Mix and apply externally.		

This, or zinc ointment, should be spread on soft old cotton or linen, as one would spread butter on bread very thickly. Then it is placed so as to cover the eruption and held in place by a bandage. The dressing should be renewed twice daily. Calamin lotion is useful in this stage also. When these do not cure one may add fifteen drops of oil of cade (a tarlike substance) to each ounce of zinc ointment. In the more chronic, scaly eczema, one drachm of oil of cade, or two drachms of liquid tar, may be added to each ounce of zinc ointment; or liquid tar dissolved in twice as much alcohol is painted on the eruption and, when the alcohol has evaporated, the skin is covered with pure zinc ointment. Comparatively small patches of chronic, scaling eczema are treated by rubbing pure tar into them or applying sulphur ointment.



Specialists sometimes find the use of the x-ray and other means not open to the laity beneficial in chronic eczema.

### ERYSIPELAS

**Causes.**—Erysipelas is a disease caused by germs (*streptococci*) which gain entrance through some wound or abrasion in the skin or mucous membranes. Even where no wound is evident it may be taken for granted that there has been some slight abrasion of the surface, although invisible. Erysipelas cannot be communicated any distance through the air, but it is contagious in that the germs which cause it may be carried from the sick to the well by nurses, furniture, bedding, dressings, clothing, and other objects. Thus, patients with wounds, women in childbirth, and the newborn, may become affected, but modern methods of surgical cleanliness have largely eliminated these forms of erysipelas, especially in hospitals, where the disease used to be common.

Erysipelas attacks people of all ages, some persons being very susceptible and suffering frequent recurrences. The form which arises without any visible wound is seen usually on the face, and occurs most frequently in the spring. The period of development, from the time the germs enter the body until the appearance of the disease, lasts from three to seven days.

**Symptoms.**—Erysipelas usually begins with a severe chill (or convulsion in a baby) and fever. Vomiting, headache, and general lassitude are often present. A patch of red appears on the cheeks, bridge of the nose, or about the eye or nostril, and spreads over the face. The margins of the eruption are sharply defined.

Within twenty-four hours the disease is fully developed; the skin is tense, smooth, and shiny, scarlet and swollen, and feels hot, and is often covered with small blisters. The pain is more or less intense, burning or itching occurs, and there is a sensation of great tightness or tension. On the face the swelling closes the eye and may interfere with breathing through the nose. The lips, ears, and scalp are swollen, and the person may become unrecognizable in a couple of days. Erysipelas tends to spread like a drop of oil, and the borders of the inflammatory patch are well marked. It rarely

spreads from the face to the chest and body, and but occasionally attacks the throat. During the height of the inflammation the temperature reaches  $104^{\circ}$  F., or over.

After four or five days, in most cases, erysipelas begins to subside, together with the pain and temperature, and recovery occurs with some scaling of the skin. The death rate is said to average about ten per cent. in hospitals, four per cent. in private practice. Headache, delirium, and stupor, are common when erysipelas attacks the scalp. The appearance of the disease in other locations is similar to that described. Relapses are not uncommon, but are not so severe as the original attack. Spreading may extend over a large area, and the deeper parts may become affected, with the formation of deep abscesses and great destruction of tissue.

Certain internal organs—heart, lungs, spleen, and kidneys—are occasionally involved with serious consequences. The old, the diseased, and the alcoholic are more apt to succumb, also the newborn. It is a curious fact that cure of malignant growths (sarcoma), chronic skin diseases, and old ulcers sometimes follows attacks of erysipelas.

**Treatment.**—The duration of erysipelas is usually from a few days to about two weeks, according to its extent. It tends to run a definite course and to recovery in most cases without treatment.

The patient must be isolated in a room with good ventilation and sunlight. Dressings and objects coming in contact with him must be burned or boiled. The diet should be liquid, such as milk, beef tea, soups, and gruels.

The use of cloths wet constantly with cold water, or with a cold solution of one-half teaspoonful of pure carbolic acid to one pint of hot water, or with a (poisonous) solution of sugar of lead, four grains to the pint, should be kept over small inflamed areas. Fever is reduced by sponging the whole naked body with cold water at frequent intervals. A tablespoonful of whisky or brandy in water may be given every two hours to adults if the pulse is weak. Painting the skin with pure tincture of iodine all about the inflamed area may prevent its spreading.

Recently a serum (antistreptococcic) obtained from a horse

immunized against the erysipelas germs (streptococci), and a vaccine, made of the killed germs of the disease, have been injected under the skin with some success. The patient must be quarantined until all scaling ceases—usually for two weeks.

## BITES AND STINGS OF INSECTS

### MOSQUITOES

The female mosquito is the offender. During or after sucking blood she injects a poison into the body which causes itching, swelling, and, in some susceptible persons, considerable inflammation of the skin. The bites of the mosquitoes living on the shores of the Arctic ocean and in the tropics are the most virulent. The most important relation of mosquitoes to man was only recently discovered; they are the sole cause of malaria and yellow fever in the human being.

#### **Treatment for Prevention of Mosquito and Other Insect Bites.**

—To prevent mosquitoes, fleas, lice, horseflies, etc., from biting, it is necessary merely to dip the clean hands into a pail of water in which, while hot, one ounce of pure carbolic acid was dissolved, and while they are thus wet rub the solution over all the exposed skin and allow it to dry naturally. A solution containing Epsom salts, one ounce to the pint of cold water, may be used in the same way. A mixture of kerosene (petroleum) and water used in the same manner will also afford protection. A more elegant protection against insect bites is attained by rubbing the skin with one of the essential oils, as oil of lavender, Eucalyptus or pennyroyal, which may be carried in a small bottle in the pocket.

**Treatment for Relief of Stings.**—All poisons introduced into the body by insects are of an acid nature (chiefly formic acid) and to this is due the pain and irritation which it is our object to overcome. The best remedy, naturally, is an alkali of some sort. Water of ammonia, diluted, or a strong solution of saleratus or baking soda in water, are the two most successful remedies to apply, either through bathing, or on cloths saturated in one of the solutions.

Clean clay, mixed with water to make a mud poultice, is a useful application in emergencies.

#### BEES, WASPS, AND HORNETS

The pain and swelling are produced by the poison of the insect which leaves the poison bag at the base of the barb at the instant the person is stung. The bee stings but once, as the sting, being barbed, is broken off, and is retained in the flesh of the victim. The sting of the wasp and hornet is merely pointed, and is not lost during the stinging process so that they can repeat the act. Bee keepers, after being stung a number of times, usually become immune, i.e., they are no longer poisoned by bites of these insects.

**Treatment.**—It is well to extract the sting of bees before all of the poison has come away. A fine pair of forceps is useful for this purpose; or, by pressing the hollow tube of a small key directly down over the puncture made by the sting, it may be squeezed out.

Spirit of camphor or diluted ammonia water, as recommended for mosquitoes, and moist clay or earth are the best remedies to relieve the pain.

#### WOOD TICKS

Ticks inhabit the woods and bushes throughout the temperate zone, and at certain periods during the summer season attack passing men and animals.

The common tick is nearly circular in shape, very flat, with a dark, brown, horny body about one-sixteenth to one-eighth inch in diameter. Each of its eight legs possesses two claws, and the proboscis incloses feelers which are similarly armed. The beetle plunges its barbed proboscis into the flesh of man or animals, and holds on very firmly with its other members till it is gorged with blood, growing as large as a good-sized bean, when it drops off. The bite is painless, and it is not until the insect is engorged with blood that it is perceptible; if, however, attempts are made to remove the tick before it is ready to go, the proboscis may be torn off and left in the skin, when painful local suppuration will follow.

Ticks are the sole means of transmitting Rocky Mountain fever to man and Texas fever to cattle.



**Treatment.**—As the presence of ticks is far from agreeable, the insect may be removed by painting it with turpentine, which either kills it or causes the claws to be relaxed, or moist tobacco may be laid over the tick; in either case the tick loosens its hold and drops to the ground. A tropical variety, carapato, buries the whole head in the flesh of its host before it is perceived, and if turpentine does not loosen its hold, the head must be dug out with a clean needle or knife blade.

### LICE

(*Pediculi*)

Head lice are most common. They are gray with black margins, about one-twenty-fifth to one-twelfth inch long, and wingless. The color changes with the host, as the lice are black on the Negro, and white in the case of the Eskimo. The female lays fifty to sixty eggs (nits), seen as minute, white specks glued to the side of a hair—usually not more than one or two on a single hair. The eggs hatch in six days.

**Symptoms.**—The irritation produced by the presence of the parasites on the head leads to general itching, more particularly on the lower part of the back of the head. The constant scratching starts an inflammation of the skin with formation of pimples, weeping spots, and crusts, from the dried discharge, possessing a bad odor. The denuded spots becoming infected, the neighboring glands enlarge and are felt as tender lumps beneath the skin at the back of the neck, under the jaw, or at either side of the neck. Whenever there is persistent itching and irritation of the scalp, particularly at the back of the head, lice, or nits should be sought for; sometimes it is more easy to find them on a fine-toothed comb passed through the hair. Lice are very common in dirty households, and are occasionally seen on the most fastidious persons, who accidentally acquire them in public places or conveyances, or from servants.

**Treatment.**—The hair should be cut short when permissible. Any crusts on the head should be softened by the application of sweet oil, and then removed by washing with soap and warm water. Petroleum or kerosene, mixed with an equal amount of sweet oil, is a good remedy. It must be rubbed on the head two successive

nights, the head being covered by a cap, and washed off each morning with hot water and soap. The patient must be cautioned not to approach an open flame after kerosene has been put on his head.

The eggs, or nits, are next to be attacked with vinegar, which is sponged on the hair and the fine-toothed comb plied daily for a week. The remaining irritation of the scalp can be cured by washing the head daily and applying sweet oil.

A more simple plan consists of the drenching hair and scalp twice with cold infusion of (poisonous) larkspur seed, made by steeping an ounce of the seed in six ounces of hot water for an hour.

This treatment will destroy both insects and eggs. After twenty-four hours the hair and scalp must be shampooed thoroughly with soap and warm water. In mild cases washing with equal parts of alcohol and water twice daily for several days will kill the lice.

#### CLOTHES LICE

These insects are a trifle larger than the head lice, being one-twelfth to one-eighth inch long, of a dirty, yellowish-gray color, and infesting the most filthy people. The lice are generally only seen on the clothes, where they live, coming out on the body to feed.

**Symptoms.**—The visible signs on the body are varying degrees of irritation from redness to ulceration, due to scratching.

**Treatment.**—The treatment is simply cleanliness of the body and clothes. A piece of sulphur or camphor, the size of a walnut, worn next to the skin in a piece of cheesecloth will protect the person from lice bites.

#### CRAB LICE

The crab louse, or crab, inhabits the skin covered by hair about and above the sexual organs most frequently, and from thence spreads to the hairy region on the abdomen, chest, armpit, beard, and eye lashes.

**Symptoms.**—Itching and scratching first call attention to the presence of the parasites, which are even more troublesome than the other species.

**Treatment.**—Application of corrosive sublimate (poisonous) in solution (two grains to one ounce of water) to the part is sufficient to kill the lice, but this treatment must be repeated several times at intervals of a week, in order to kill the parasites subsequently hatched. Repeated washing of the hair with vinegar will remove the nits (eggs).

### FLEAS

Fleas, unlike lice, do not breed on the body, but as soon as they are satiated leave their host. Their eggs are laid in cracks in floors, on dirty clothes and similar spots, and it is only the mature flea which preys upon man. The human flea may infest the dog and return to man, but the dog flea is a distinct species, and never remains permanently on the human host. For these reasons it is not difficult to get rid of fleas after they have attacked the body, unless continually surrounded by them.

**Symptoms.**—Flea bites are recognized by the itching caused by the poison introduced by the insect, and by points of dried blood surrounded for a little while by a red zone. In the case of children and people with delicate skins, red or white lumps appear resembling nettlerash. Generally the skin is simply covered with minute, red points, perhaps raised a little by swelling above the surface, and when very numerous may remotely resemble the rash of measles.

**Treatment for Prevention of Flea Bites.**—Bags of Persian insect powder worn next to the skin will prevent the bites of fleas.

Bubonic plague is spread only by fleas from rats (having the disease) biting man.

### BED BUGS

The bed bug is a brown oval-shaped insect of repulsive odor. It is capable of conveying any infectious disease from the blood of one person to another through its bites, so that the domestic horror it inspires is not imaginary. It lives in crevices in wall paper, bedsteads, furniture, woodwork, etc., and is very hard to get rid of.

**Fumigation, Etc.**—Oil of turpentine should be applied to all the inner surfaces of the bed, to the spring and the bedding and bed, and the room should be fumigated with sulphur once every two weeks until no further signs of the bugs appear.



Sulphur candles may be bought for the purpose, but three pounds are required for an ordinary room sealed tight. Persian insect powder placed in the bed will prevent bugs from biting a person.

**Treatment.**—Small lumps on the skin with purple spots in the center, are the result of bed bug bites. The application of carbolized vaselin will relieve the irritation.

### JIGGERS OR SAND FLEAS

(*Chique, Chigo, and Nigua*)

The jigger is common in Cuba, Porto Rico and Brazil. About one-half the size of the ordinary flea, it is of a brownish-red color with a white spot on the back. The female lives in the sand and attacks man on whom she lives, boring into the skin about the toe nail usually, and laying her eggs under the skin, which gives rise to itching at first and then violent pain.

The insect sucks blood and grows as it gorges itself, producing a white swelling of the skin, in the center of which is seen a black spot, the front part of the flea. The flea after expelling its eggs drops off and dies. People with habitually sweaty feet are exempt from attacks of the pest.

Unless the flea is unattached, one must either wait until the insect comes away of its own free will, or remove it with a red-hot needle in order to destroy the eggs. The negroes peel the skin from the swelling with a needle and squeeze out the eggs. Ordinarily the bites do no permanent injury, but occasionally, if numerous, or if the insect is pressed into the skin in the effort to remove it, or if sores resulting from bites are neglected, then violent inflammation, great pain, and even death of the part may result.

Sound shoes and a night and morning inspection of the feet will protect against the inroads of the sand fleas.

### FLIES

The common housefly does not bite, but is constantly inimical to human health by conveying disease germs from typhoid fever, cholera, and other disorders from bowel discharges of patients suf-



fering from these diseases to articles of food on which the insects light. Flies have been a fruitful source of sickness in military camps (the recent Spanish-American and Anglo-African campaigns).

**Prevention and Relief.**—The bites of the sandfly, gadfly, and horsefly may be both relieved and prevented by the same means recommended in the case of mosquitoes for these purposes.

### SCORPIONS—CENTIPEDES

These both inhabit the tropic and semitropical regions, and lurk in dark corners and out-of-the-way places, crawling into the boots and clothing during the night. Scorpions sting with their tails, which are brought over the head and back for the purpose, while holding on to the victim with their lobsterlike claws. The poisonous centipede has a flattened brownish-yellow body, with a single pair of short legs for each body segment, and long, many-jointed antennae.

The wounds made by either of these pests are rarely dangerous, except in young children or those in feeble health. The stings are usually relieved by bathing with a two per cent. solution of carbolic acid, with rum, or with lemon juice.

### SPIDERS

Many of the tropical spiders bite the human being. Trapdoor spiders are among the most common of these pests. Their bodies grow to great size, two to two and one-half inches long, and are covered with hair, giving them a horrible appearance. They live in holes bored in the ground, and provided with a trapdoor contrivance which is closed when the insect is at home.

The trapdoor spider resembles the tarantula, by which name it is usually known in Cuba and Jamaica, but is somewhat smaller and more common. Neither the stings of the trapdoor spider nor true tarantula are usually dangerous, although the wounds caused by the bites may heal slowly.

**Treatment.**—Application of diluted water of ammonia and of the other remedies recommended for mosquito bites are useful here, and if the patient is generally depressed by the poison, strong coffee forms a good antidote.

## CHAPTER X

### POISONS AND ANTIDOTES—FOOD POISONING

List of poisons and antidotes. Food poisoning, including meat, fish, cheese, ice cream, potato, and canned food poisoning. Tapeworm, round worms, pin worms. Trichiniasis. Hookworm disease.

### POISONS AND ANTIDOTES

**General Rules.**—Be sure the person is actually poisoned and not merely frightened. Send for a doctor. Find the name of the poison, but waste no time if this is not easy. Do not empty the stomach if the poison is a strong acid or alkali (see Alkalis and Acids under list of Antidotes below). Otherwise empty the stomach by giving one tablespoonful of mustard stirred into a whole glass of tepid water. If this does not cause vomiting at once give two tablespoonfuls of common salt in a whole glass of tepid water.

Then make the patient tickle the back of his throat with his finger, or tickle it with a feather. After vomiting has occurred give the patient two or three glasses of lukewarm water in rapid succession and then tickle his throat to make him vomit it up again. By repeating this several times it is possible to wash out the stomach, almost as well as the doctor with his stomach tube. Zinc sulphate one-half drachm is a most powerful emetic, but mustard and salt are generally efficient. Next give the patient milk in which have been stirred the whites of four raw eggs and a tablespoonful of whisky or brandy.

As an antidote for any poison, when the poison is unknown, give one tablespoonful of powdered charcoal with one teaspoonful of magnesia, and one-half teaspoonful of tannic acid, mixed together in a glass of water.

**Stimulation.**—Most poisons depress the action of the heart and the breathing. After emptying the stomach and giving the milk, eggs, brandy (and charcoal, etc., if it is obtainable at once), get the patient flat on his back with no pillow under his head, cover him well and place hot water bags or bottles about his feet and legs. Do not burn him. Apply a mustard plaster or homemade paste (one part of mustard with two parts of flour mixed together in a paste and spread between two pieces of old cotton cloth or two handkerchiefs) over his heart. Give a tablespoonful of brandy or whisky in a little hot water every fifteen minutes, if weakness persists; strong black coffee is also a stimulant. If the stomach will not retain anything inject one pint of warm, strong, black coffee containing three tablespoonfuls of brandy or whisky, into the bowel, with a fountain syringe. Severe pain caused by irritant poisons may be relieved by fifteen to twenty drops of laudanum <sup>1</sup> in a little water, or one-quarter of a grain of morphin injected under the skin. These doses are for adults only.

**Definition of Antidote.**—An antidote is a substance counteracting the effects of a poison by chemically altering it in the stomach or by antagonizing its effect on the body when the poison is absorbed. As antidotes are only partially successful it is always safer to empty the stomach first, unless it happens that the chemical antidote is at hand, when it may be given first and again after emptying the stomach to neutralize any poison not removed.

Washing the stomach with a tube is the most effective method and that which the doctor uses. Following is a list of poisons and antidotes. When the name of the poison is known look for special treatment in this list.

#### LIST OF POISONS AND ANTIDOTES

**Acetanilid, Antipyrin, Phenacetin, Headache Powders.**—Empty the stomach. Keep the patient flat on his back with his head low. Cover warmly and place hot water bottles at his feet. Inject one-half pint of strong black coffee with two tablespoonfuls of brandy

<sup>1</sup> Laudanum (opium) and morphin are powerful drugs, sold only on a doctor's prescription.

or whisky into the bowel, if there is vomiting. If the breathing fails perform artificial breathing.

#### ACIDS

**Acetic, Muriatic, Nitric, Oxalic, Phosphoric, Sulphuric, and Tartaric Acids.**—Do not empty the stomach. Give two teaspoonfuls of baking soda, or chalk, magnesia, or whitewash in a glass of water; or powdered crayons, or plaster from the walls, or a glass of soap suds (laundry soap is best). After giving one of these, follow with a glass of milk, the white of four raw eggs and a cupful of sweet oil. Give stimulants (*see Stimulation*).

**Carbolic Acid.**—Very common source of poisoning. Smallest fatal dose is one teaspoonful but more often one tablespoonful is fatal. Recovery has occurred from four ounces.

Empty the stomach. Emetics commonly fail to act and so, if there is not a doctor at hand to wash out the stomach with ten per cent. alcohol, give a tablespoonful of Epsom or Glauber's salts in a glass of water and milk and four raw eggs by the mouth. Brandy or whisky is advised as an antidote but merely makes the carbolic acid more soluble and is dangerous unless it can be washed out by a stomach tube.

Give four tablespoonfuls of brandy and a pint of warm, strong, black coffee by the bowel, as advised in section above, on Stimulation. A doctor should also give subcutaneously camphorated oil, strychnin, and atropin. Artificial respiration is sometimes necessary.

**Aconite.**—Empty the stomach. Patient absolutely quiet on the back. External heat (*see Stimulation*, page 175).

#### ALKALIS

**Ammonia, Quicklime, Caustic Potash, Lime, Soda, Lye, and Washing Soda.**—Do not empty the stomach. Give one-half a glass of vinegar with an equal amount of water, or the juice of four lemons in a glass of water; or dilute solutions of muriatic, acetic, or citric acids. Follow with whites of four raw eggs, milk, and a cupful of sweet oil. Keep the patient warm in bed with head low, and stimulate with brandy and black coffee.



## OTHER POISONS

**Antimony, Including Tartar Emetic and Other Salts.**—Give two or three cups of strong tea, or better a teaspoonful of tannic acid in a glass of water.

Vomiting is usually profuse from the poison. Give plenty of water to wash out the stomach. Keep the patient warm in bed and treat as advised in section above, on Stimulation.

**Antipyrin.**—*See* Acetanilid.

**Arsenic. Including Paris Green, Scheele's and Schweinfurt's Green, White Arsenic, "Rough-on-Rats," and Fowler's Solution.**—Empty the stomach very thoroughly; then give four raw eggs and a glass of milk and magnesia as antidotes. The best antidote is the so-called Arsenic Antidote kept by druggists.

**Belladonna, Including Atropin.**—Empty the stomach. Give injection into the bowel of one pint of warm, strong, black coffee. Follow this by artificial respiration. The doctor should give caffeine, strychnin and pilocarpin, subcutaneously.

**Camphor, Including the Spirits and Liniment.**—Large doses of camphor may cause dizziness and convulsions but are rarely fatal. Empty the stomach. Apply heat, and stimulate as described in section above on Stimulation. If camphor has been taken in the solid state by children do not give alcoholic stimulants.

**Cannabis Indica, Indian Hemp.**—While this drug may cause intoxication and delirium it is not a fatal poison. Empty the stomach and arouse the patient.

**Cantharides—Spanish Flies.**—Empty the stomach and give the whites of four raw eggs and milk, flaxseed tea and barley water. Avoid oils. Place hot poultices over the abdomen. Give the patient one teaspoonful of baking soda in one-half glass of water. Opium for pain as advised under Stimulation above.

**Chloral.**—Empty the stomach. Give one pint of warm, strong coffee by the rectum, with brandy or whisky, and treat as recommended under paragraph on Stimulation. Try to keep the patient from sleeping; this may be accomplished by slapping him on the face and chest with a towel. It may be necessary to perform arti-

ficial respiration. A doctor should give strychnin and caffen subcutaneously.

**Chloroform (Swallowed).**—Empty the stomach. Give one teaspoonful of baking soda (bicarbonate of sodium) in a glass of water. Keep the patient from sleeping by slapping and pinching him. Give sweet oil to relieve the pain. Follow the directions in section on Stimulation.

**Cocain.**—Empty the stomach. Give brandy and whisky by the mouth or rectum. Let the patient inhale ether till he becomes quiet. Use stimulation as advised under the section on Stimulation. It may be necessary to do artificial respiration. A doctor should inject morphin, which, with ether, are the best antidotes.

**Colchicum.**—Empty the stomach and give two cups of strong tea or one-half teaspoonful of tannic acid in a glass of water. It will be necessary to stimulate as described in the section on Stimulation, and also use opium or morphin to relieve the pain. A doctor should inject atropin, caffen and camphorated oil under the skin.

**Conium.**—Empty the stomach. Then give two cups of very strong tea or one-half teaspoonful of tannic acid in a glass of water. Stimulate as described at the beginning of this chapter. Artificial respiration may be necessary. A doctor should give subcutaneously strychnin, camphorated oil, digitalone and atropin.

**Copper Salts, Including Blue Vitriol and Verdigris.**—Fruit cooked in copper kettles may cause poisoning by copper. It is not necessary to empty the stomach, as vomiting occurs. Give the whites of four raw eggs and milk. Stimulate as described at the beginning of this chapter. Potassium ferrocyanid is the antidote. Opium is generally necessary for pain. Sweet oil will relieve the irritation in the stomach.

**Corrosive Sublimate.**—Antiseptic Tablets and Solutions for Killing Bugs.—Empty the stomach. Give whites of four raw eggs and milk, also flour and water. Stimulate as described at the beginning of this chapter. A doctor should give morphin, digitalone, and atropin, subcutaneously.

**Creosote—Creolin.**—*See* Carbolic Acid.

**Croton Oil.**—This is one of the most powerful irritants known.

Empty the stomach. Give the whites of four raw eggs and one pint of milk. Stimulate and give opium for pain.

**Digitalis.**—Empty the stomach. Give two cups of strong tea or one teaspoonful of tannic acid. Stimulate as described at the beginning of this chapter. Give fifteen drops of the tincture of aconite to an adult.

**Formalin.**—Used as a disinfectant. Give ammonia diluted; or repeat frequently, two tablespoonful doses of solution of ammonium acetate. Vomiting is severe, so that there will be no need to empty the stomach. Stimulate as advised at the beginning of this chapter.

**Gelsemium.**—Empty the stomach, if noticed early. Stimulate as advised at the beginning of this chapter. Artificial respiration, pp. 37, 42. A doctor should inject  $1/50$  grain of atropin subcutaneously.

**Holly Berries.**—These are sometimes eaten by children. Empty the stomach, and stimulate as advised at the beginning of this chapter.

**Hydrocyanic Acid.**—Empty stomach. Artificial respiration. External heat.

**Hyoscyamus.**—*See* Belladonna.

**Iodin.**—Tincture of iodine is often taken accidentally. Give a mixture of powdered starch and water at once. Follow by emptying the stomach and then by giving the whites of four raw eggs and a glass of milk. Stimulate and give opium for pain.

**Iodoform.**—Absorption from wounds or taken internally. Give teaspoonful doses of baking powder (sodium bicarbonate) in water. Stimulate with alcohol and heat as advised at the beginning of this chapter.

**Lead.**—Poisoning from white or red lead, paint, sugar of lead, or its solution. Empty the stomach. Give one tablespoonful of Epsom salts in a glass of water. Follow with milk and the whites of four raw eggs and apply heat and stimulate as advised at the beginning of this chapter.

**Lime and Lye.**—*See* Alkalis.

**Lobelia.**—Empty the stomach. Give two strong cups of tea, or better one teaspoonful of tannic acid in a glass of water. Stimulate and give opium for pain. A doctor should inject caffeine and camphorated oil under the skin.



**Lysol.**—*See* Carbolic Acid.

**Nitrate of Silver.**—Empty the stomach and give plenty of common salt and water. Follow with the whites of four raw eggs, milk and sweet oil. Stimulate and give opium for pain.

**Opium and Morphin.**—If taken by the mouth empty the stomach. The antidote is ten grains of potassium permanganate in a pint of water. This should be given as soon as possible and repeated in half an hour. Sometimes the stomach cannot be emptied with emetics, but antidote should be given whether this is possible or not. Do not allow the patient to sleep, pinch him, slap him with a wet towel, pour cold water on his head, and keep him moving about. Hold smelling salts at his nose. Give strong coffee to drink repeatedly.

A doctor should inject atropin (one-twentieth of a grain to every grain of morphin taken), strychnin and caffein subcutaneously, and may use a faradic battery on the skin. Artificial respiration may be required.

**Nux vomica.**—*See* Strychnin.

**Phenacetin.**—*See* Acetanilid.

**Phosphorus, Including Sucking Matches, Rat Poison or Phosphorus Paste.**—There may be an odor of phosphorus in the breath. Empty the stomach. Give five grains of potassium permanganate in a glass of water or hydrogen peroxid, one ounce in a glass of water. The best emetic is copper sulphate, five grains every five minutes until vomiting ensues. Follow with one tablespoonful of Epsom salts. Give one-half a teaspoonful of baking soda three times daily for some days. Avoid all oils and fats.

**Potash.**—*See* Alkalis.

**Strychnin—Nux vomica.**—Empty the stomach at once. Give two cups of strong tea, or better one-half teaspoonful of tannic acid in a glass of water, and powdered wood charcoal freely mixed with water.

If convulsions are present give inhalation of chloroform and two drachms of sodium bromid, and one-half drachm of chloral should be injected in a pint of water into the bowel. Artificial respiration may have to be done.

**Tobacco.**—Empty the stomach, give one-half teaspoonful of tan-



nic acid in water or two cups of very strong tea. Repeat these. Stimulate as described at the beginning of this chapter. Artificial respiration may have to be done. A doctor may have to inject camphorated oil and strychnin subcutaneously.

**Oil of Turpentine.**—Empty the stomach. Give the whites of four raw eggs and a pint of milk; also one tablespoonful of Epsom salts in a glass of water. Stimulate and give opium for pain.

**Veronal.**—This is often taken with suicidal intent. Unconsciousness and rash are seen on the body.

Empty the stomach. Stimulate with coffee by rectum. The doctor should give caffein and strychnin, subcutaneously.

**Washing Soda.**—*See Alkalis.*

**Wood Alcohol.**—Empty the stomach. Stimulate with coffee by the rectum. Give also inhalation from bottle of smelling salts.

**Zinc Salts, Including White Vitriol and Butter of Zinc and Some Soldering Fluids.**—Empty the stomach if vomiting has not been profuse. Give one-half teaspoonful of tannic acid in water, or two cups of strong tea, and the whites of four eggs. Stimulate as described at the beginning of this chapter.

## FOOD POISONING

This is commonly but wrongly, in most cases, called ptomain poisoning. Food poisoning is poisoning by germs and their poisonous products, which are not commonly true ptomains or special chemical substances (alkaloids) found in putrefying animal or vegetable substances.

Then again the term ptomain poisoning is applied so frequently and with such disastrous consequences to acute organic abdominal diseases, as appendicitis and gall-stones, that it should be abandoned. When fever is present, in most instances, the case is not one of food or ptomain poisoning.

Food poisoning includes poisoning by meat, fish, lobsters, crabs, clams, mussels, snails, cheese, ice cream, cream, milk and its products, potatoes, canned meat, and vegetables.

As the poisons are all formed by the growth of bacteria, and as such growth occurs more readily in warm weather, it follows that food poisoning usually is seen in summer. Again, cooking will generally prevent poisoning, but not in some cases, for while cooking will kill the germs it does not always destroy the poisons produced by them. Some of the fatal cases of meat poisoning have followed the eating of cooked meat. Moreover, bacteria find their way into cooked food, and thus form violent poisons. This applies particularly to fish, lobsters, crabs and oysters, which should never be eaten later than twenty-four hours after cooking, even when kept on ice. They should be cooked alive or as soon as dead, and eaten as soon as cooked. Shell fish should be killed by cooking.

**MEAT POISONING.**—Meat is poisonous when derived from diseased animals or when kept too long. Beef from cows which are slaughtered because of disease of the intestines or udder, or that infection which follows calving, is the most common cause of the reported cases of poisoning; also veal from calves, which have had navel infection, has been a frequent source of poisoning. It goes without saying that no diseased animal is fit for food. In meat which is hung too long bacteria breed and form poisons; but even here the meat from healthy animals has not been so commonly the cause of poisoning as meat derived from diseased animals.

Chopped meat, sausages and game are the most common kinds of meat which produce poisoning as a result of being kept too long. Chopping meat makes it more susceptible to the growth of germs. What is called sausage poisoning is due to the growth of a special germ in sausages, ham, meat patés and corned beef, where the meat is not exposed to the air on account of a covering, as the skin of sausages, fat or patés, or ham, etc. The poison formed by this germ (*Bacillus botulinus*) acts on the nervous system (*See Symptoms of Food Poisoning below*). Thorough cooking destroys this poison.

**FISH POISONING.**—Poisoning, as from meat, is due to germs in diseased fish, or to those which grow in fish after cooking.

Oysters growing in water defiled by sewage become infected and convey the bacteria of typhoid fever, dysentery, and diarrheal diseases, and rarely Asiatic cholera (in countries where the disease

exists). Poisoning is most apt to occur from raw oysters, but as oysters are not cooked long, there may be danger in eating cooked oysters grown in contaminated water. One should always know the habitat of oysters and clams before eating them. Then it is said that all oysters are diseased in summer (Bardet). The writer has been in the habit of eating oysters from the bed during the summer in many places, and without harm, but it is a good rule to avoid the bivalves in this season.

**CHEESE POISONING.**—Many cases of severe poisoning from cheese have been reported. The germs, producing the poison, originated from the cow and in most cases probably found their way into milk from the intestines of the cow in manure. It has been indeed estimated that as much as ten tons of manure are daily consumed in milk in one of the large cities of the world.

Germs multiply in milk products, even in ice cream when kept at the lowest temperatures. Besides the dangers of chemical poisoning (germ-made) from cheese, ice cream, and milk products, special diseases are frequently communicated to man by milk. Thus a quarter of the tuberculosis in children is derived from cow's milk, the germs escaping from the cow chiefly in manure which contaminates milk, while thousands of cases of typhoid fever, diphtheria, and scarlet fever have originated from milk in one city alone during the past few years. In these cases the milk has become contaminated by human carriers of these diseases. The only sure means of preventing such is proper heating or cooking of milk.

**POTATO POISONING.**—Many outbreaks of poisoning from both new and sprouting potatoes have been recorded. There is a poison (solanin) which sometimes is formed in badly sprouting potatoes, and it is most abundant in the peel. More often the poisoning in man has been traced to germs introduced by cooks in handling cooked potatoes.

Potato poisoning may be prevented by not using old sprouting potatoes and by always peeling them and carefully removing the eyes and sprouts before boiling them; also by not keeping them long in warm weather, after they are cooked, and especially by enforcing cleanliness in those who handle cooked potatoes.



Potato salad has been a frequent source of poisoning.

**CANNED FOOD.**—Canned meat, fish, and vegetables have often caused poisoning, owing to the development of germ poisons through imperfect heating or sealing of the can; in such cases the top of the can usually bulges from accumulation of gas (blown can). In many cases the meat was diseased or putrefying before being canned.

Vegetables used for salads directly from the can, instead of being recooked as they should be, have been responsible for most of the cases of poisoning. Cooking will destroy many of these poisons. Considering the enormous amount of canned food consumed the occurrence of poisoning from the same is rare. No blown can should ever be used.

**Symptoms of Food Poisoning.**—The sudden illness, at about the same time, of a number of persons who have partaken of the same food constitutes the chief basis for the diagnosis of food poisoning—particularly when the kind or character of the food warrants suspicion.

An interval of two to twenty-four hours may elapse before symptoms appear after the poisonous food has been taken, but sometimes this period has been as long as one to two weeks. In the latter case, owing to the small number of germs swallowed, or to the fact that not much germ poison was present in the food, time is required for the poison to be formed through the growth of germs in the patient. This corresponds exactly to the period of development of any contagious disease after exposure to the same. In most instances a person swallows the germs along with much ready-made germ poison so that symptoms appear as rapidly as after the taking of any other chemical poison.

The symptoms form two groups: 1. More often poisoning begins with violent vomiting and abdominal pain and diarrhea; there may also be headache, cramps in the muscles, thirst, dilated pupils, and even delirium. Marked prostration, muscular weakness, pale clammy skin, with weak pulse and cold hands and feet, are commonly seen. Various forms of rashes on the skin are frequent. 2. In poisoning by sausage, canned vegetables, corned beef, ham, and cheese, the digestive symptoms just described may be absent and nervous symptoms



may predominate as follows: In these cases there are disturbance of vision, drooping of the eyelids, dryness of the mouth, difficult swallowing, loss of voice, obstinate constipation, and difficulty in passing urine. Death may occur from general paralysis.

**Treatment for Food Poisoning.**—The treatment of food poisoning is similar to that already described for poisons generally, i.e., to empty the stomach and bowels and then stimulate the heart, respiration, and nervous system.

It is best to procure medical aid, if possible, to wash out the stomach. If vomiting occurs, it is not necessary to use an emetic, but the patient should be encouraged to swallow all the lukewarm water possible and then tickle the back of the throat so as to vomit it up again. The same process should be repeated a number of times and the result will be almost as effective as though the stomach had been washed through a tube.

A tablespoonful of salt or mustard in the water should be given if vomiting is not free. Then the bowels should be emptied by enema, if there is much vomiting, or by giving two or three compound cathartic pills. For the general depression the patient should be kept in bed surrounded by hot water bottles and the advice given under Stimulation should be followed.

## FOOD CONTAINING PARASITES

The most important of the parasites found in food in this country are the tapeworm and trichina. The hookworm was supposed to enter the body in food or water but it is now known that the skin is the chief, if not the sole, portion of the anatomy through which it gains entrance into the body. The guinea worm is exceedingly rare in the United States, although common in Africa and the East Indies. It enters the body in food and finds its way to the skin of the foot or ankle, usually, where it forms a blister which breaks and leaves the worm at the bottom of a small ulcer. The worm then discharges its young and leaves the individual. The worms are solitary and twenty to thirty inches long.

### TAPEWORM

Beef and, less commonly, pork tapeworms attack men. Tapeworm is caused by eating raw or imperfectly cooked "measly" beef or pork. If raw, measly beef is very finely minced, or the juice from the same is strained, the danger of tapeworm is averted. Measles are embryo tapeworms, called from their appearance "bladder worms." In from six to ten weeks after entering the intestine of man these bladder worms become full grown and measure from six to twelve feet (pork tapeworm) to fifteen to twenty feet (beef tapeworm) in length. They are divided into white, flattened joints. The head is of the size of a pinhead, the neck is not much thicker than a thread, but the middle and lower part of the body is from one-fourth to one-half an inch wide. The bladder worms inhabit chiefly the muscles of the jaw in beef where they should be found and condemned by inspectors; the bladder worms in pork are easily seen on the under surface of the tongue.

**Symptoms.**—The symptoms alone are not sufficiently characteristic to enable a doctor to make a diagnosis of tapeworm. Nausea, colic, and diarrhea are most common; sometimes there is anemia. There may be a ravenous appetite, and patients often are much worried and depressed if they know they have tapeworm. Headache, emaciation, itching, loss of appetite and constipation are sometimes seen.

It is quite probable that in most cases there are no symptoms and that the discovery of the segments of the worm, which look like flat portions of macaroni, are the first signs of the disease. They are the only positive signs, together with the passage of eggs. The disease is not dangerous and is susceptible of complete cure.

**Treatment.**—For two days the patient should take only milk or broths, and on the third day nothing but water, which may make the worm loose his hold on the intestine. Castor oil, three tablespoonfuls, should be taken on the afternoon of the first two days, and a tablespoonful of Epsom salts on the evening of the third day. On the morning of the fourth day one drachm of oleoresin of male fern is given in syrup, and the same dose repeated one hour later.

The patient should remain quiet in bed to avoid nausea. One hour after the second dose a heaping tablespoonful of Epsom salts should be taken in a glass of water and, if this does not move the bowels within an hour, a second dose of salts is desirable.

The patient should sit on a chamber half full of water at body temperature, so that the worm may be passed without being broken. Unless the head comes away the worm will grow again. If the worm is hanging from the bowel, an injection of soap-suds should be given to dislodge it.

The tapeworm should never be dragged out by force as it will break. There is danger that children with tapeworm may convey the eggs of the worm, escaping from their bowels and soiling the skin about these parts, to their mouths in sucking their fingers. In that event the immature worms developing in the intestine may be carried to various organs of the body and threaten the child's life.

Pumpkin seed is very efficient in killing tapeworm while harmless to the patient. The seed should be thoroughly pounded into a pulp and soaked in water twenty-four hours. They are given mixed with sugar or syrup on an empty stomach in the morning. The dose for an adult is four ounces, for a child one or two ounces. An hour after the dose of pumpkin seed an adult should take three tablespoonfuls of castor oil, a child one tablespoonful.

Measures for preventing tapeworm include the burning of the tapeworm from the human being, the efficient inspection of meat, and proper cooking of pork and beef, in order to kill any parasites.

There are many other efficient and powerful drugs for destroying tapeworm. They are not safe unless used according to a doctor's orders and for this reason, and because mucus and other matters contained in excrement are often taken for worms, it is always best to consult a doctor.

### ROUND WORMS

(*Ascarides*)

The large round worm (*Ascaris lumbricoides*) is the most common intestinal parasite attacking man and is found more often in children and in the insane. Its eggs may leave one person and enter



the mouth of the same individual, or another, and develop into new parasites without the intervention of another host, as in the case of tapeworm.

Round worms inhabit the upper part of the bowels. They are from four to ten inches long, reddish or yellow-brown in color, and pointed at both ends. One female may produce sixty million eggs; these are minute, oval, and reddish brown in color. They occur in great numbers in the excrement of the host—as many as three thousand have been counted in a piece of human excrement no bigger than a grain of wheat. Four ridges run the length of the worms; those on each side are brownish, while a whitish ridge is seen on the back and belly. In rare instances the worms may find their way into the stomach, throat, ear, nose, liver, and lungs.

The mode of entrance of the eggs into the body is somewhat obscure. The mouth is the probable gateway. Children are more prone to worms because more unclean in their habits. They suck their dirty fingers, after scratching themselves about the exit of their bowels, and in this way return to their mouths the eggs which have escaped from their intestines. The eggs of the round worm may be taken into the mouth in impure drinking water, or on uncooked, green vegetables or fruit, especially if contaminated with human excrement.

No person who has worms should be permitted to handle cooking or eating utensils or food.

**Symptoms.**—One would suppose from hearing the opinions of many mothers that worms and teething together accounted for the major part of infantile illness. Both are greatly overrated as sources of disease. Unless round worms are present in considerable numbers it is probable that they will produce no symptoms in robust subjects. The only certain proof of their presence in the human body is their appearance in the excrement or vomited matter.

Among the more common symptoms suggestive of worms are the following: irritability, twitching, fidgets, grinding the teeth when asleep, picking the nose, fever, convulsions, irregular or ravenous appetite without proportionate gain in weight, foul breath, constipation, vomiting, or diarrhea. The same symptoms may occur from



many other causes and therefore may have no connection with worms.

**Treatment.**—The child should have only broth or milk for twenty-four hours and then, before breakfast, the fluidextract of pink-root and senna should be given—one-half teaspoonful for a child of two years; one teaspoonful for a child of four to ten years; two teaspoonfuls for an adult. The dose may be repeated two or three times during the day, if the bowels do not move freely, and the medicine may be given on two or three occasions until the worms are expelled. It is well not to repeat the dose on successive days but to give the child a day or two of rest from the previous dosing, before beginning the treatment again.

Great cleanliness should be enforced as to washing the parts about the anus and the hands, after every movement of the bowels.

The excrement containing worms or eggs should be burned.

#### PINWORMS—SEATWORMS—THREADWORMS

(*Oxyuris vermicularis*)

These are minute threadlike worms, from one-seventh to two-fifths of an inch long. They live in the lower part of the bowels. They may be seen coating the excrement, or clinging to the exit of the bowel or neighboring parts. They are more likely to escape during the night and may be found on the sheet.

The eggs remain in the female worms until they escape from the body but scratching may crush the worms, and the eggs may get under the finger nails and are conveyed to the mouth, when they may reinfect the patient. This may all occur during sleep.

Pinworms are more common in children and in the insane. There is always great itching about the bowel during the night, and scratching occasions redness, swelling and inflammation in this part. In girls the worms may wander into the vagina, or front passage, and lead to inflammation, with swelling and discharge from the sexual organs. This local inflammation may also induce general irritability, sleeplessness, loss of appetite, anemia, fainting, bed-wetting, and masturbation in children.

The worms may enter the mouth in water or upon raw vegetables or fruit.

**Treatment.**—Injections into the bowel are usually sufficient to remove pinworms. Each morning the bowel should be washed out with cool water and Castile soap, lying the child with hips raised on a pillow, so that the water may flow as far back as possible into the bowel. In older children a better position consists in lying on the face (turned to one side), chest and knees. The patient should kneel on the bed, with the head and chest also pressed on the bed for support, so that the body slants downward and forward and the hind quarters are raised high from the bed.

After giving the enema the parts about the bowel are washed well with soap and water, and dried. Then carbolized vaselin or boric acid ointment is applied to relieve itching. It is well also to give children each morning a dose of pink-root and senna, as advised for round worms, for several days—in order to expel worms from the higher parts of the bowel not reached by the injections.

Whenever the bowels move the various parts thereabout should be thoroughly washed, and towels, bed clothes, and night garments should be boiled, in order to prevent further infection with the parasites.

Children's toys should be burned, carpets cleaned, and floor and furniture washed to avoid a return of the disease through eggs attached to these objects.

When the pinworms are not readily expelled by simple soapsuds injections, these may be followed by an injection of a strong solution of common table salt and water. This should be retained in the bowel as long as possible, a folded towel being pressed against the back passage to keep the injection in. The injections should be repeated each day for ten days.

#### TRICHINIASIS

This is a very painful and dangerous disease caused by the presence in the muscles and other tissues of little worms which are eaten in raw or partly cooked pork, ham, bacon, or sausage. They may also occur in uncooked or partly cooked salted or smoked pork.

The disease is only common among Germans since they often eat raw ham and sausage.

The diagnosis is very difficult in single cases. In autopsies on persons dying of other diseases in Buffalo, over five per cent. were found to have the worms in their muscles.

**Symptoms.**—Nausea, loss of appetite, colic, and diarrhea occur within a few days of eating the infested pork, but these symptoms are sometimes absent.

From seven to ten to fourteen days after eating the trichinous pork fever develops with pain, swelling, stiffness and tenderness in the muscles, so that the disease is sometimes thought to be rheumatic fever but the joints are not swollen. There may be pain in swallowing and chewing. Swelling of the face, and especially about the eyes, is very suggestive of the disease. Difficulty in breathing, hoarseness, and sweating, are frequent.

Delirium, bronchitis, pleurisy, and pneumonia are among the more severe complications.

When a number of persons come down with an apparent typhoid fever, with the painful symptoms noted, after a German birthday Fest trichiniasis should be suspected (Osler). Examination of the remains of pork, ham, or sausage left from the party, and of the excrement and muscle of the patients for the worms, may decide the diagnosis. Examination of the patient's blood for changes is also important.

**Treatment.**—There is no special treatment other than to empty the bowels, in persons who have been poisoned by eating meat. Following the use of two two-grain doses of calomel two hours apart, for an adult, a tablespoonful of castor oil or Epsom salts in a glass of water should be given four hours after the second dose of calomel.

The mortality is from one to thirty per cent. in different epidemics. The outlook is best in children. Many unrecognized cases are classed as typhoid fever or rheumatism.

**Preventive Measures.**—The moral is to cook pork thoroughly. The boiling of sausages for fifteen minutes before frying them is advisable.



**HOOKWORM DISEASE***(Ankylostomiasis)*

The hookworm has, from the most ancient times, probably been responsible for an enormous amount of sickness all over the world, but it is comparatively recently that its significance has been fully appreciated.

There are two varieties of hookworms, the American variety being first described by Stiles of the United States Agricultural Department, in 1901.

The disease exists in most tropical lands and also to a considerable extent in temperate regions, as is shown by its great prevalence in the following countries: The population is affected by hookworm in Porto Rico to the extent of 90 per cent., while 60 to 80 per cent. are infected in India, about 15 per cent. in the Philippines, and in the whole United States from 20 to 80 per cent. of persons harbor the hookworm, the disease being particularly common in the Southern states. A considerable proportion of adult hosts of the hookworm may, however, appear healthy.

The hookworm belongs to the same family as the common round worm (*Ascarides*) of children. It is very slender, from one-sixth to one-third of an inch in length (the longer the female) and the mouth is provided with sharp teeth which enable it to hook onto the inside of the bowel. The eggs are microscopic, and swarm in the bowel discharges of the patient, as many as four million having been found in one movement.

The eggs begin to divide into segments in the bowels of the patient and this goes on outside the body in the ground with the formation of the immature worms (larvae). The eggs hatch best in earth at the temperature of 70°-90° F. but may withstand freezing, and immersion in water for months. Under favorable conditions the young worms may be ready to enter the body within four or five days after the eggs are discharged from the bowels of a patient. The worms may be taken into the mouth in water or on soiled fingers, but the common mode of entrance is through the skin. The young worms bore their way through the skin of the feet and legs of the



barefoot; and through the hands and arms of miners and gardeners. The worms are carried through the veins to the heart and lungs and thence find their way up the windpipe into the throat where they pass into the stomach and fasten onto the first part of the small intestines and suck blood from the host.

The worms not only remove blood directly, but they secrete a poison which tends to destroy the blood in the patient's body and lessens its clotting capacity. The patient may also suffer from blood poisoning from bites of the worms becoming infected with germs in the bowels.

**Symptoms.**—These are seen more often in children and young adults. Pallor, weakness, stunted growth, lack of energy, laziness, "a dull, blank stare," pot belly, loss of appetite, nausea, pain and tenderness in the belly, colic, diarrhea, and general ill health without actual disease, are characteristic.

The laziness of the South and Porto Rico is attributed to hookworm. The notorious clay eaters of the South who eat earth, clay, starch, hair, etc., have a perverted appetite because they are sufferers from hookworm.

Ground itch is a skin eruption caused by worms entering the skin and is especially common as small blisters, which later contain matter or pus under and between the toes. In severe cases patients may become bedridden with great weakness and pallor and swelling of the feet and other parts of the body.

**Diagnosis.**—The previous occurrence of ground itch, and the presence in the patient of pallor, and weakness, usually suffice in affected regions to enable a diagnosis to be made. The presence of blood in the bowels is significant of hookworm. If a portion of bowel discharge is placed on a piece of white blotting paper and, after an hour or two a rusty stain appears about it, we have a simple test for blood. The positive test is the discovery of eggs in the bowel discharges, two or three teaspoonfuls of which should be collected in a wide-mouthed bottle for microscopical examination by a doctor.

**Treatment.**—The rules of the Porto Rico Commission follow. The patient should take a tablespoonful of Epsom salts in a glass of

water before eating in the evening. At 6 a. m. next morning one-half the dose of thymol in capsules is taken. At 10 a. m. another dose of salts is taken. At 8 o'clock the next morning the other half of the dose of thymol is taken. The dose of thymol varies from seven grains, for children under five years of age, to sixty grains for adults. No wine or other form of alcohol should be taken while the medicines are acting. Come for more medicine until the doctor says you are cured. Have a privy in your house. Use the privy and do not move the bowels on the surface of the ground. Do not walk barefooted, so that you may avoid contracting the disease in your feet. Wear shoes and you will never suffer from anemia.

In infected regions it is well also to boil drinking water and to be particular about having the hands clean before eating. The bowel discharges should be covered in privies with milk of lime made by adding one part of freshly slaked lime to four parts of water.

In Porto Rico the Commission's work in fighting hookworm has reduced the mortality from forty-two to twenty-one deaths per thousand annually.

## CHAPTER XI

### MENSTRUATION AND ITS DISORDERS—DISEASES OF WOMEN —CHANGE OF LIFE

Menstruation: normal, painful, absence of, arrested, scanty, delayed, and excessive. Leukorrhea. Signs of pregnancy. Miscarriage. Death of child in the womb. Change of life.

#### MENSTRUATION

Menstruation consists of a flow of blood and mucus from the womb for an average period of five days, but varying normally in different women from two to ten days. These periods occur at intervals of twenty-eight days usually, but exceptionally the intervals vary from twenty-one to thirty days. The reasons for, causes, and uses of menstruation are still matters of theory. Animals, with the exception of the higher apes, have only a discharge of mucus at similar periods.

The possible child-bearing period of women corresponds usually to the time from the appearance of the first menstruation to its cessation at the "change of life," or menopause.

The usual time at which menstruation or the "unwell" periods begin is from fourteen to fifteen in the United States (exceptionally from nine to eighteen years), and they continue till forty-two to fifty years. In the tropics menstruation begins on the average at ten to eleven years; in the Arctic regions at sixteen; while the Slavs menstruate first at fourteen, and the Hungarian Jews at thirteen. This is the period of puberty, or the age when the sexual organs develop.

Puberty should really be considered to extend from the begin-

ning of menstruation to the twentieth year. During this time the changes characteristic of the feminine sex appear, as enlargement of the breasts, broadening of the hips, general rounding of the outline from the deposit of fat under the skin; also growth of hair at the lower part of the abdomen and under the arms.

There is a popular misapprehension that menstruation is the time at which conception occurs. This is not the case, although conception is most apt to take place during the eight days following the end of menstruation. Conception occurs when the ovum or egg escapes from the ovary (ovulation) and passes down through the fallopian tube into the womb and unites with the male seed, following sexual intercourse (during which some twenty-six million male seed may be liberated).

But while the escape of the ovum or egg (one, or occasionally two in twins of opposite sexes) from the ovary usually takes place at the same time as menstruation, this is frequently not the case and conception may happen at any time. Conception occasionally is seen in women who have not menstruated for months, as while nursing a baby, or even after the final cessation of menstruation at the "turn of life." Stated briefly, ovulation is not always synchronous with menstruation.

The average possible child-bearing period is thirty years, or from fifteen to forty-five. The earliest pregnancy on record was in a girl of eight, and the oldest woman known to have borne a child was seventy, and these dates approximately correspond to the earliest and latest unwell periods recorded in medicine. Pregnancy in a woman over sixty is rare, but many instances have been recorded between fifty and sixty. Menstruation sometimes appears in women after both ovaries have been removed.

There is a regular cycle of health in women, the acme of which is reached a few days before menstruation, and following this is a period of more or less mental and physical depression, during menstruation, and a gradual improvement in health after its cessation.

**Symptoms of Menstruation.**—The first appearance of menstruation in the girl may be heralded by some irritability, restlessness, feeling of weight in the loins and headache, but more severe trouble



is not present unless there is some displacement of the womb, or disease.

Symptoms ordinarily occurring in women should also be very slight, if the general health is good, unless there is some disorder of the sexual organs. Among the more common symptoms are the following: some swelling and soreness of the breasts with slight enlargement of the tonsils and thyroid gland, a feeling of being hot or chilly, some frequency in urination, heaviness in the region of the womb and loins, nausea, headache, dizziness, and cold hands and feet.

Women are more subject to colds at this time. The character of the patient is also altered so that she may be irritable, depressed, quarrelsome or even fierce. No woman exhibits all these symptoms, but some of them are common. So much is the character changed that it has been found that most crimes of women are committed during menstruation—including suicide, and the more terrible ones, down to shoplifting among the prosperous.

At the beginning of menstruation there is a white discharge of mucus from the private parts, followed by blood, which reaches the maximum on the second day, lasts several days, and gradually ceases—to be replaced by a white flow of mucus for a few days longer. The amount of blood lost varies from two to ten ounces, usually from six to eight. It is often measured by the number of napkins worn, which average fourteen in number, but this is a very uncertain criterion.

When the menstruation begins late in life (after fifteen), it often ceases early—at the age of forty-five. On the other hand when it begins earlier it commonly lasts longer—till the age of fifty or so. Menstruation usually ceases (not always) when a woman becomes pregnant and begins again soon after the birth of a child—unless the mother nurses her infant, when it is ordinarily delayed until after weaning time. Occasionally women become pregnant during the period of nursing, although not menstruating.

When the womb is removed, of course bleeding from it is forever over, and usually with the removal of both ovaries menstruation ceases and an artificial "change of life" begins.

Menstruation may sometimes persist, however, after the latter

operation. It is somewhat difficult to define what is abnormal menstruation, as some women flow more and longer than others, or have more pain, or may be somewhat irregular. Severe pain is always abnormal, and also flowing above the average, or rather the patient's average.

**Care of Normal Menstruation.**—In order that menstruation may be normal, girls must be cared for from early age. Attention to the general health is the chief thing until the beginning of menstruation (see Personal Hygiene). Then the girl should be prepared for the occurrence as a natural event in her life. She should be made to rest, although not necessarily in bed, during the period and should not tax herself in any way, by study, exercise or amusement, and the diet should be simple during the time of menstruation. Special care of the girl up to her twentieth year, or during the age of puberty, is also advisable to avoid future menstrual troubles. She should lead a quiet life, have a plain diet, and not overtax her strength by amusements, study or work, and as the sexual life has begun, care should be taken in the selection of her books, associates, theatrical amusements, etc., so as to avoid undue stimulation of the sexual functions. Pregnancy is inadvisable before the twentieth year because the muscles are undeveloped, the bony outlet has not reached its full size, and because the girl has not attained the full mental, moral, and physical development to care for a child. The grown woman should free herself from more taxing affairs for two days before menstruation and rest part of the day on a bed while unwell.

A warm bath may be taken for two minutes daily, unless it causes too much flowing. When the flowing is scanty, a hot sitz bath is useful. Cold baths during menstruation are to be avoided. The diet should be simple. The use of a hot water bag over the lower part of the abdomen often relieves discomfort. The taking of alcohol to relieve pain is unwise as the habit is all too readily acquired in the case of some, and it is impossible for the individual to know that she is not in this category without experimenting. Constipation is to be avoided as it increases congestion about the womb. When she feels she is going to be unwell a woman should take a Seidlitz powder,

or one-half bottle of magnesium citrate or other laxative, before breakfast. A woman should loosen her corsets, when unwell, to avoid compression of her abdomen.

**Painful Menstruation (Dysmenorrhea).**—The pain may be mild or excruciating and in the back, loins, or low down in the abdomen; and it may be sharp, dull, dragging, or cramplike. It may come on before or during menstruation, and may cease or increase with the flow. It may last only a day or two, or continue through the whole period. There is always a certain amount of congestion preceding normal menstruation.

Pain may be caused by abnormal congestion, by inflammation of the womb or neighboring organs, and by various diseases noted below. The pain may be so severe that the general health suffers, and nausea, faintness, and nervous symptoms (as hysteria) produced by the pain may occur. On the other hand, nervous diseases, as hysteria and neurasthenia, may lead to great suffering.

The presence of much bleeding and clots may cause severe labor-like pains in their expulsion, and the same applies to the existence of retained fluid, or membranes in membranous inflammation. Obstruction to the blood vessels in displacements may increase the congestion, and malformations, and obstruction to the outlet of the womb may lead to pain from retained secretion.

In pain from inflammation of the ovaries, there are tender breasts and pronounced nervous symptoms. The suffering begins before the menstruation, the pain extends down into the thighs, and there is tenderness over one or both ovaries, which are situated low down in the abdomen about two inches either side of the middle line. Tumors of the womb cause painful menstruation by producing displacement and increasing the congestion.

The causes are either local or general. Sometimes when no local cause can be discovered by a physician painful menstruation is one of the first signs of a nervous or neurotic temperament. To avoid painful menstruation the care of the young girl already advised above and also discussed under sexual hygiene, should be followed. Any causes which excite the sexual functions unduly will produce congestion and painful periods. Thus excessive sexual intercourse,



masturbation, books, plays or associates stimulating the sexual appetite, or poor general health, may occasion dysmenorrhea.

**Treatment of Painful Menstruation (General Measures).**—When there is severe pain during menstruation a doctor should always be consulted. Treatment which is not based on the causes present in the particular case may be futile or harmful in wasting time and so lead to breaking down of the general health. Only when a doctor cannot be had are the following suggestions to be followed.

The patient subject to painful menses should stay in bed from the onset. She should take a laxative, as advised above, and abstain from tea, coffee, alcohol, and meat. The drinking of six glasses of water daily, chiefly between meals, will be of advantage. A good masseuse can often relieve congestion and bring relief by general and abdominal massage given once daily during menstruation for one-half to three-quarters of an hour. Sexual intercourse in the married should be omitted until the patient no longer has painful periods. Husband and wife should occupy separate beds or rooms.

Heat is most efficacious. Heat is utilized by the patient in taking hot sitz or full baths for fifteen minutes once daily while the pain lasts. This is not advisable if there is much flowing, but such is not present in most cases of painful menstruation. Then, in the case of married women, a douche as hot as possible, while lying in the bath tub on the back with the legs drawn up, will be of service, when taken once daily between the periods. As much as four quarts of water should be used at a time from a fountain syringe. The same posture may be taken on a bed or table by using a douche pan or Kelley pad to catch the escaping water. Unmarried women should only take such douches by a doctor's advice. The employment of a hot water bag over the lower abdomen is also of value.

Hayden's viburnum compound is an old, valuable and harmless remedy given in teaspoonful doses once hourly in hot water, until the pain is relieved or until three doses are taken. When the nervousness is pronounced the patient may take ten grains of strontium bromid, together with a teaspoonful of tincture of valerian, in one-half glass of water, three times a day.

**Absence of Menstruation (Amenorrhea).**—Absence of menstru-



ation may be due to many causes; these are local or general. But general causes may lead to local, as will be seen. In the case of absence or faulty development of the sexual organs menstruation will probably never occur—this is a very rare condition, however.

Various diseases give rise to wasting of the sexual organs. Inflammations of the womb after labor may end in wasting of the womb and permanent cessation of menstruation. A similar condition occasionally follows such acute diseases as typhoid, scarlet fever, and diphtheria, but in these cases the menstruation is usually resumed again.

In many chronic diseases the stopping of menstruation is a compensatory provision of nature to save loss of blood, as in tuberculosis, diabetes, Bright's disease, heart disease, malaria, and anemia, although sometimes in anemia there may be excessive flowing. The cessation of menstruation is not a cause or common sign of tuberculosis, as thought by the laity.

If the flow never appears in a young girl, and yet she has all the other sensations peculiar to menstruation, she should be examined by a physician to determine whether there is any obstruction to the escape of blood. This is rare, and usually the late appearance of menstruation is due to poor development of the sexual organs from anemia and general poor health.

Sometimes an apparently healthy girl may menstruate regularly at first and then stop. In many of these cases the hygiene is imperfect and the girl is devoting too much energy to amusements, social entertainments, or to excessive study or work. There are instances when menstruation ceases in robust young women with normal sexual organs, without apparent cause, and may only return after marriage. Pregnancy has occurred in these in the entire absence of menstruation.

The occasional omission of a period during the first year of menstruation is normal but after that time it should appear at regular intervals.

Nervous shocks frequently lead to cessation of menstruation, as great emotion, fright, grief, or anger. Anxiety lest pregnancy occur, in the newly married or in the woman who has immorally exposed

herself to the possibility of pregnancy, may thus cause a delay in the monthly flow. Radical changes of climate and surroundings may stop the monthly flow for several periods in women immigrants seen in this country.

Chill, as exposure to cold, sitting on damp ground, wearing wet clothes, or bathing in cold water at the beginning of menstruation may arrest it. Exhausting occupations, overwork or study, insufficient food, fresh air and exercise favor amenorrhea. Also premature social excesses in the young.

Absence of menstruation is often accompanied by all the usual symptoms except the flow and there may also be ringing in the ears, defective sight, sweating and various skin eruptions.

When menstruation has once become well established its cessation is due more commonly to anemia and debility in underfed and overworked young women. Pallor, constipation, fluttering of the heart, dyspepsia and gas in the stomach or bowels, fainting at slight provocation, and cold hands and feet are among the common complaints in this condition, together with a feeling of weight in the lower part of the abdomen and a white or yellowish discharge from the private parts.

**Treatment of Amenorrhea.**—Treatment consists in relieving constipation and taking a modified 5-grain Bland's pill (of iron) three times daily after meals for several months, stopping the pill for a week, however, each month; also the keeping of early hours and securing plenty of sleep, fresh air, exercise, and a simple diet, the avoidance of tea, coffee, fried food, cakes, pies, fresh bread, candy and sweets, and the relief of the "whites."

Absence of menstruation in young girls who are pale, thin, listless, and poorly developed, must be treated in the same manner by taking them from school and making them live out of doors on wholesome food with four glasses of mixed rich cream and milk daily, at breakfast, in the middle of the morning, afternoon, and at bedtime. Iron is useful if the doctor finds the patient actually anemic, as pallor alone is no sure sign of anemia.

**Beginning Menstruation Suddenly Arrested.**—If the monthly flow has already begun but is suddenly stopped through exposure to

cold, fright, etc., there may be a chill, fever, backache, headache, bearing-down pains in the lower part of the abdomen, pain in the thighs, and frequent desire to pass water. The patient should take a full bath or sitz bath for twenty minutes, as hot as can be comfortably borne, and then go to bed. A teaspoonful of Hayden's viburnum compound in one-half glass of hot water may then be taken every hour for three doses. If the pain continues, and a physician cannot be reached, a suppository containing one-fourth of a grain of belladonna extract should be introduced into the bowel (rectum). There may be absence of several menstrual periods following such an attack.

**Scanty or Delayed Menstruation.**—All the symptoms commonly denoting the coming of menstruation may be present and yet there may be no flow. During this time there may be pain or a dragging feeling low down in the abdomen, back, and thighs, pain and fullness in the head, cold hands and feet, and general mental and physical depression. In some cases the flow is so scanty that little relief is afforded.

In delayed menstruation, not due to pregnancy, the taking of hot sitz baths for fifteen minutes twice daily, and a capsule of apiolin four times daily, may rapidly bring on the normal flow. Massage, as advised above, may relieve the discomfort. But in some women who cannot afford to lose much blood the normal period of flow is only two days while in a full-blooded female a flow for ten days may not be abnormal. The causes of a scanty flow are the same as of complete absence of menstruation, and the treatment also. The patient should therefore consult a physician concerning her local and general condition.

In the case of married women, who are subject to scanty flow and disagreeable conditions due to congestion at the period, the use of douches of water, taken night and morning between the periods, as hot as can be comfortably borne, may be of service. The proper method of taking douches has been described above. Douches are not to be recommended for young unmarried women.

**Flowing, Bleeding, or Hemorrhage from the Womb.**—Under this heading we will consider two kinds of flowing: (1) excessive bleed-



ing at the monthly periods, and (2) bleeding from the womb at other times.

The same causes which lead to excessive loss of blood at the monthly periods often occasion bleeding from the womb at any time. Any condition which brings a greater amount of blood to the womb than is natural or alters its structure or the composition of the blood, may produce bleeding from this organ. Among the common causes are inflammation of the womb, fallopian tubes, and ovaries; tumors, as cancer and fibroid tumors; displacements, in obstructing the return flow of blood; foreign bodies, as retained afterbirth; and general diseases, as heart disease, hemorrhagic disorders, scarlet and typhoid fevers, and malaria. Constipation and tight lacing both may interfere with the circulation in the lower part of the abdomen and are frequent causes of excessive flowing from the womb; also hardening of the arteries in the womb.

What shall be considered excessive flowing depends somewhat on the history of the individual case. In general a menstruation which lasts six days, with the use of fifteen napkins, may be considered normal.

Excessive menstruation in girls and young unmarried women is commonly due to poor nutrition, debility and anemia and some other general or local conditions (other than disease of the womb), even appendicitis. Rest in bed for a day or two with attention to the general health as advised above may cure the condition, but the advice of a doctor is more to the point. The patient will be glad to learn that a local examination is not usually required in these cases.

In all cases of undue loss of blood during the periods in married women a physician should be consulted to determine the cause, and by this means steps will be taken toward remedying the trouble. It is most important that women should get professional advice in the case of flowing at times other than at their regular periods. Especially is this true after the age of thirty-five in married women who have even a slight discharge staining the clothing brown, or just enough bleeding to soil the clothes between the periods. And again, after the completion of the change of life, the appearance of a watery



discharge and a very little blood at irregular intervals calls for immediate professional consultation.

In fibroid tumors of the womb there are long periods of flowing with intervals of freedom from hemorrhage. Fibroid tumor also usually appears in women over thirty-five years of age, and while not always requiring removal, yet the operation is almost invariably successful and without danger in the early stages.

Irregular bleeding from the womb in young married women, especially if there are any signs of pregnancy, as morning nausea or vomiting, tenderness and swelling of the breasts, absence of the usual regular periods, with perhaps pain in one side of the lower part of the abdomen, should cause the patient to seek a physician's advice at the earliest moment because such a condition is suggestive of a pregnancy in which the child is situated in the fallopian tube, instead of in the womb (extra-uterine pregnancy). In these cases an operation is absolutely imperative to avoid rupture of the tube as the child grows. This trouble may result fatally, if left alone, but operations at the stage described are practically without danger.

Flowing during the later months of pregnancy, even if slight and occasional, is suggestive of a faulty or low position of the after-birth or placenta (placenta previa) which is pressed upon by the head of the child in the womb and so subjected to injuries. The fact of the bleeding should be brought to the immediate notice of a physician in order that he may take steps to avert what might be a serious hemorrhage at childbirth from tearing away of the placenta in the dilatation of the womb.

**Emergency Treatment of Flowing.**—It is rare that flowing is so excessive during the monthly periods that it becomes dangerous or requires immediate treatment to stop it. Such flowing is produced by the various causes noted above and should receive proper attention and study by a doctor. We will, however, here describe the general emergency methods which may be used with ease and safety by the patient or attendants to arrest undue flowing from the womb from any cause and at any time—when medical attendance is not obtainable:—

Rest in bed with the head low and the foot of the bed raised a foot

from the floor (on boxes) is of the greatest importance. The patient must keep as quiet as possible and take a teaspoonful of fluid-extract of ergot in one-half glass of water and repeat it in half teaspoonful doses at half hour intervals for three doses. If the patient is pregnant ergot is not to be recommended.

The injection into the front passage of six quarts of water, as hot as the elbow can comfortably bear, with the patient lying flat on her back in bed on a rubber sheet or douche pan, is most valuable. The injections should be given with a fountain syringe raised two feet above the patient; and they may be repeated in four hours. A teaspoonful of alum added to the last quart may increase the action of the injection in stopping the flow.

In order to stop dangerous hemorrhage, which cannot be arrested by the means described, it may be necessary to fill the cavity of the front passage, and perhaps the womb, with clean, sterile cheesecloth—but this can only be done properly by a doctor. Usually the simpler methods will suffice to arrest the bleeding until medical aid can be obtained.

The most dangerous and severe flowing is apt to occur immediately after childbirth, and this may be best controlled by firm pressure on the outside of the lower part of the belly over the womb, grasping the womb, if possible, between the thumb and fingers and keeping up steady downward pressure for half an hour or so—regardless of the moderate suffering it may cause the patient. The use of ergot is of the greatest value here in the doses described above.

The various causes of flowing noted above should of course be avoided. Quiet and rest in bed, with prevention of constipation, are the chief aids in cure.

### THE WHITES—LEUKORRHEA

Leukorrhea, or the whites, consists in a discharge from the private parts of women which comes either from the womb or front passage (vagina). It is not a disease but a sign of disease of either the female sexual organs or of the whole body. When it only appears

for a few days before and after menstruation, during pregnancy, or the change of life, it may be regarded as a natural occurrence—providing it is not associated with other symptoms of local or general disease.

In ordinary conditions there should be no perceptible discharge from the private parts of women and if such occurs—with the exceptions noted—it should be regarded as a symptom of general or local disease, and a physician should be consulted.

The discharge is not by any means white, as the common term “whites” would suggest, but it may be yellowish, brownish, or reddish if mixed with blood, or colorless, like white of egg. It also varies greatly in consistency and amount.

**Causes.**—Among general disorders causing leukorrhea are: debility, anemia, malaria, tuberculosis, and various acute diseases, as typhoid and scarlet fevers, measles, and diphtheria. Exposure to heat, dampness, and emotional excitement may occasion the disorder.

The discharge is white or watery, when due to disturbance of the general system, whereas in local disease it may be thick and yellow, as in pus from a wound.

Whites is one of the most frequent symptoms of inflammation of the womb, tubes, ovaries, and neighboring structures; also of injuries of these organs, as following lacerations occasioned by childbirth. It is produced by tumors, displacements of the womb, irritating injections, and by too frequent sexual intercourse, etc. In all cases of local disease of the sexual organs there are usually other symptoms present—as pain in the lower abdomen and back or front passage, frequency, and perhaps pain in urination, and often a thick and yellowish discharge. Leukorrhea is a common disorder of advancing age but should never be disregarded as it may indicate the occurrence of a tumor at any time after thirty-five and it may then be dark colored, thin, and perhaps foul or blood stained.

In young children whites may be due to worms, and should receive medical attention. As a result of continuous discharge the skin about the private parts become much irritated, and itching, chafing, rawness, and soreness often eventuate. While a copious discharge is a certain drain on the system, yet, if there is general



weakness, the "whites" is more than likely to be the result of the general condition rather than the cause.

Leukorrhea, beginning suddenly and accompanied by frequent and painful urination, and swelling and soreness of the external parts, is extremely suggestive of gonorrhea, a grave sexual disease communicated from man through sexual intercourse. It is sometimes seen in babies and little girls who acquire the disease from towels or other objects contaminated with the germs. Patients with this trouble should remain in bed, use only hot water to bathe the private parts, and take ten drops of tincture of belladonna with one-half teaspoonful of sweet spirit of niter in a whole glass of water three times daily to relieve the painful urination. The main object should be to consult a doctor, however, as gonorrhea is the most common cause of inflammation and abscess of the tubes and ovaries—ultimately requiring the surgical removal of these organs—if it is neglected.

It will be seen then that like other local diseases leukorrhea may be due to many causes, some of which are of the most extreme importance and demand the best medical advice. The treatment which follows is only recommended when a physician's services are not obtainable or for the form occurring in pregnancy.

**Treatment.**—The patient should wear a pad of clean absorbent cotton over the private parts, held in place by the ordinary unwell napkin. Many women believe that covering the passage increases the discharge; this is not so and cleanliness is an important part of the treatment. An injection into the front passage of boiled water (four quarts), which is just comfortably warm, should be made with a fountain syringe once daily or every other day. To the last quart a teaspoonful of alum may be added. In case of non-pregnant women the water should be as hot as the elbow can bear. The patient should lie on her back, on a douche pan or rubber sheet or bath tub, to carry off the escaping water.

Taking a douche sitting on the water closet is not so effective but may be done. Itching of the private parts is relieved by the injection but, if this is not sufficient, the parts should be bathed with a pint of hot water (in which is very thoroughly mixed a teaspoonful



of diluted carbolic acid solution) and then the parts should be dusted with the following powder:—

#### FORMULA FOR POWDER

Boric acid.....	1 drachm
Zinc oxid .....	3 drachms
Starch .....	6 drachms
Mix and apply with absorbent cotton.	

At other times the parts may be bathed with warm water and tar soap and then the powder may be dusted on.

### SIGNS OF PREGNANCY

**Absence of Menstruation Due to Pregnancy.**—Pregnancy is the more common cause for cessation of menstruation in married women. When there is a possibility of pregnancy, delayed menstruation should receive no treatment. If the condition is actually one of pregnancy there is no drug or other means known to the medical profession by which it is possible for a woman to bring on a miscarriage without greatly endangering her life—apart from the great immorality and crime of the proceeding. The same difficulty of causing a harmless abortion, the same danger to the patient's life and the same degree of crime obtain if the patient is but a week pregnant.

Persons who perform abortions are usually as incompetent as they are criminal, and blood poisoning and death of the patients are not infrequent. The very secrecy required is of itself sufficient to prevent the abortionist from giving the patient proper care, even if he were competent to give it. There is no justifiable cause for interrupting pregnancy save when the condition threatens the mother's life—which occasionally happens. But in such a case a consultation of reputable physicians is considered necessary before properly deciding upon such a grave and important step. The only course for women who fear pregnancy is to wait, and the result will be evident in time. A physician should be consulted and he may at early date be able to give a probable opinion as to the condition,

although it is impossible for him to give a positive opinion before the third month and possibly not until the sixth.

Women illegitimately pregnant should either marry, or arrange to give birth to a child at full term privately, and prevent the publicity which ruins the afterlife. There are many societies and charitable institutions which not only assist women in this lamentable state but aid in the care and disposition of the child. Here, as in most other cases of physical and mental trouble, the advice of a good, competent physician will smooth the way and prove of more value to the unfortunate woman than anything else.

**Special Symptoms.**—Complete cessation of menstruation is the rule, although occasionally there may be but a slight amount of flowing at the regular period even when the subject is pregnant. Morning vomiting appears often as early as the end of the first fortnight and may last until toward the fourth month of pregnancy.

This vomiting differs from the ordinary kind usually in that, after the woman gets out of bed and vomits, she may feel free from nausea, have a good appetite and be able to eat as well as usual. Occasionally there are, however, symptoms common to ordinary indigestion, as pain in the stomach, gas, nausea, loss of appetite, with belching of sour matter, burning in the region of the breast bone, and vomiting at various times during the day.

Changes in the breast are fairly constant. The breasts swell, and slight pain or itching are felt in them. The dark area about the nipple enlarges and from ten to twenty little projections are seen on it by using a hand mirror. The breast has a firmer and more knotty feeling and its veins under the skin are larger and bluer. After the third month a clear fluid can usually be squeezed from the breast and later on a little milky fluid. These breast symptoms are more reliable in women who have never had children, as, in those who have, the breast changes noted are already present to a certain extent.

Pregnant women are susceptible to various other ailments, as nervous changes, irritability, piles, varicose veins, salivation, toothache, sour stomach, heartburn, constipation, itching, cramps, breathlessness, backache, and the "whites."

Women sometimes imagine that they are pregnant, having all the signs mentioned—absence of unwell periods, morning sickness, breast changes, enlargement of the abdomen, and finally labor pains—only to give birth in the end (as Dr. Wrench expresses it) to “bitter disappointment.” This condition (spurious pregnancy) is due to continual distention of the bowels with gas, or to accumulation of fat, or the presence of a tumor combined with a peculiar nervous condition (as hysteria), and may occur in young married women or in women at the “change of life.”

There are certain distinctions between pregnancy and such rare conditions. In pregnancy the enlargement begins low down in the abdomen about the end of the sixteenth week and increases steadily, and is hard and not soft, as with fat.

The navel flattens out or actually bulges, in the latter months of pregnancy, but dips in as usual in the fat. In the last few weeks of pregnancy the womb drops down so that a flattened space is left in the abdomen below the breast bone. If a doctor can hear the heart of the child beating (after the end of the fifth month) or feel its movements in the abdomen of the woman (after four and one-half months), the diagnosis of pregnancy is absolute.

#### MISCARRIAGE<sup>1</sup>

The most common cause of flowing during pregnancy is threatened abortion. In such a case the patient should at once go to bed, save all the discharge, clots, etc., which come away, and send for a doctor without delay. In case a physician cannot be reached the patient may also take a tablespoonful of paregoric, or ten drops of laudanum, in water, but neither of these should be repeated.<sup>2</sup>

Miscarriage is most frequent during the first three months, and again after the twentieth week, so that within these times the pregnant woman should be particularly careful. Miscarriage within the first ten weeks is often a simple and painless matter, but all mis-

<sup>1</sup> Miscarriage and abortion are used synonymously here. More precisely abortion means expulsion of the child during the first three months, and miscarriage expulsion from the third to seventh month, and premature labor after that time.

<sup>2</sup> Both forms of opium are powerful preparations, sold only on a doctor's prescription.



carriages must be carefully treated because danger threatens—if there is neglect—through bleeding and blood poisoning. The first danger results from retained afterbirth and the latter from uncleanly attendance.

Miscarriages should on the whole be taken as seriously as childbirth, because the danger is about the same in each. There is one miscarriage to every five childbirths, and almost every other married woman has a miscarriage at some time.

**Causes.**—Miscarriage is caused by many fevers and chronic diseases, among which syphilis is by far the most common cause. Other causes include displacements of the womb, hot douches, hot baths, nervous shocks, riding in jolting conveyances, riding the bicycle or horse, pedaling a sewing machine, long walks and dancing, the use of alcohol or strong cathartics, hot or cold baths, frequent sexual intercourse and nursing a baby during pregnancy. All these causes should therefore be avoided by pregnant women if possible.

When bleeding continues, following an abortion, it is usually a sign that a part of the afterbirth has remained in the womb. This should be immediately removed by a physician to avoid the dangers of possible blood poisoning. After the twentieth week it is common for the child and afterbirth to come away entire, but in the first three months this frequently does not occur.

#### DEATH OF CHILD IN THE WOMB

This is a comparatively rare occurrence. The mother has a cold feeling in the lower part of the abdomen and notices that neither the belly nor breasts continue to enlarge. There may also be a brown discharge from the private parts. The danger to the mother is not great if the case is managed by a competent doctor.

#### CHANGE OF LIFE OR MENOPAUSE

Change of life marks the end of active sexual life in woman, although the pleasure resulting from sexual intercourse may remain for several years after this period.



Change of life begins with irregularity in the time and amount of flowing, and after the flowing has permanently ceased, the general symptoms to be described may occur. In the healthy woman the discomfort of this period is comparatively slight; the intervals between the periods are irregular and increase, while the flow may be scantier or much greater.

The change requires from many months to five years for its completion, and the average age at which it begins varies from forty-five to fifty, and more rarely from forty to fifty-two years. Flowing later than the latter period is abnormal. Change of life more often occurs early in women who have not borne children, or have suffered from grief, anxiety, disease, and exhausting pregnancies; also in the fat; while the menopause is more apt to be deferred in healthy and happily married women who have borne children. The unwell periods occasionally cease early, and after a considerable time may begin again, but such an unusual condition should receive medical attention. Menstruation is so irregular and different than usual, during the change of life, that it is wiser to consult a doctor because it not infrequently happens that an unusual flow or discharge is attributed to the time of life when it may indicate a serious condition which cannot receive too early attention.

The chief general disturbances are those affecting the circulation and nervous system. These include the rush of blood to the face and head, "hot flushes," headache, nosebleed, shortness of breath on exertion, floating spots before the eyes, giddiness, throbbing of the heart, faintness, and noises in the ears. Then there is irritability of temper, unreasonable dread, as of cancer of the womb or breast, and emotional excitement. Free perspiration, numbness, tender spots, and neuralgia may be present. The character may change so that the patient is indecisive, moody, and there is some failure of judgment and memory. There may be sleepiness, or sleep may be poor, and sometimes the sexual desires are unpleasantly strong. Digestive disorders, with flatulence, constipation, or diarrhea, are not unusual. If there has been ill health from disease of the tubes, ovaries, etc., it often ceases and patients become robust. After the flow has finally disappeared there may be a mucous discharge at intervals.

The reappearance of blood should be a sign to the patient to consult a doctor. Ordinarily women soon recover their health and often gain in flesh, but in some cases they become thinner. Profuse and continuous flowing or serious mental disturbance during the change of life should always demand medical attendance and not be neglected because due to supposedly natural causes.

**Treatment.**—During the menopause women should be protected from worry, responsibility, and overfatigue. A daily warm bath (105° F.) is useful in overcoming the flushing of the skin. The woman should stay submerged in it for fifteen minutes, adding as much water as necessary to keep up the temperature. Massage is particularly good for irritable skin and digestion. Tea, coffee and alcohol are inadvisable and the food should be digestible, with a minimum of meat. The patient should retire so as to get at least an hour of sleep before midnight and take her breakfast in bed. The bowels are kept free by means of a diet of vegetables and stewed fruits, honey, etc. (see Constipation), and by the use of a little Carlsbad salts in a glass of water on arising.

General nervousness is benefited by ten grains of strontium bromid in one teaspoonful of tincture of valerian three times daily in half a tumbler of water after meals; or a five-grain asafetida pill taken after each meal and at bedtime may be used instead. It is, however, unwise, to take either stimulants or sedatives continually.

## CHAPTER XII

### PREGNANCY

Hygiene of pregnancy. Treatment of ills accompanying pregnancy. List of articles for childbirth. Emergency care of childbirth. Aftercare of mother.

#### HYGIENE OF PREGNANCY

The symptoms and signs of pregnancy are discussed in the preceding chapter. The duration of pregnancy from the first day of the last menstruation is two hundred and eighty days. A simple method of reckoning is to count back three months from the first day of the last menstruation and add seven days, in order to find the date of expected birth of the child. This is correct for seven months in the year, but from four to six days should be added when conception occurs in the other months.

The adding of two hundred and eighty days to the date of the first day of the last menstruation is the most accurate method of ascertaining the date of expected labor. When the date of probable conception is known then labor may be expected in two hundred and seventy-one days from that time. It is well to acquaint the doctor, who is to have charge of the case, as soon as the fact of pregnancy is probable. He will desire to examine the urine weekly during pregnancy, and also to examine the mother with a first child to ascertain whether the baby may be born without hindrance, and to determine the position of the child.

Exercise for the pregnant woman is essential to strengthen the muscles on which an easy labor depends, but stretching, lifting, jarring, jumping, the use of the sewing machine, bicycling, riding, motoring (except upon smooth pavements), and dancing, should be

avoided. The patient should reduce the amount of exercise to which she has been accustomed.

A large amount of food is requisite, but the separate meals should not be large, especially as pregnancy advances. To avoid this there should be light lunches taken between the regular meals and at bedtime. One of the chief dangers of pregnancy consists in the large amount of waste matter resulting from the activity of the vital processes going on in the body of the mother and child, and this is best eliminated by the use of daily warm baths (not hot), the drinking of six or eight glasses of cool (not iced) water during the day, preferably half an hour before meals and at bedtime. Also for the same purpose the bowels must be kept open each day. If the diet recommended, under Constipation, will not suffice, then some mild cathartic may be taken, as a teaspoonful of compound licorice powder, or one or two compound laxative pills at night, or a Seidlitz powder or a teaspoonful or more of sodium phosphate in a glass of cold water on arising.

Since the clothing should be loose, corsets are inadvisable after the first few months, and a linen waist, sold for this purpose, may be worn, to which the lower garments and stockings are fastened. Circular garters favor enlargement of the veins in the legs. An abdominal support affords great relief in the later months of pregnancy, such as the Storm binder.

The teeth are prone to decay during pregnancy because the lime salts are used up in the growth of the child, but especially because of frequent acid eructations from the stomach into the mouth which destroy the teeth. It is wise to brush the teeth three times daily with milk of magnesia and to consult the dentist at frequent intervals during this time.

Most women have a good appetite and gain in weight and good looks during pregnancy, but if they fail in health and grow thin, then iron and lime are needed as well as frequent examinations of the urine. One Bland's five-grain pill of iron, and two teaspoonfuls of the syrup of calcium lactophosphate should be taken in water, three times daily after meals.

Pregnant women require at least eight hours' sleep and plenty



of fresh air. As much as three pints of urine should be passed daily, and if this does not occur, when the quantity of water advised is taken, then a physician should be consulted.

Milk or other fluids, as cocoa, may be substituted to some extent for water. There should be great moderation in tea and coffee—not more than one cup of either daily; and alcohol in any form is usually harmful. Fried food, pastries and sweets must be avoided, and meat should be eaten in moderation but once daily.

The chief danger in pregnancy is from a kind of poisoning which, in its worst form, causes convulsions late in pregnancy. To avoid this the drinking of water, the exercising, and elimination of waste matters by increased urinary secretion and daily movement of the bowels, together with activity of the skin, produced by warm baths, are all important. The avoidance of much meat is also important since the waste matters from meat are eliminated by the kidneys, already overworked.

Sexual intercourse is allowable, providing it is moderate and the times of its occurrence do not coincide with the dates of menstruation—were they present. It should be avoided by the pregnant woman during the last month of pregnancy, owing to the size of the abdomen, and in case of former miscarriages the danger of another is increased by sexual intercourse. Sexual intercourse is inadvisable for six weeks after childbirth.

## **TREATMENT OF ILLS ACCOMPANYING PREGNANCY**

A discharge (leukorrhea) from the vagina is quite common in pregnancy and this may cause irritation and itching of the external parts. An injection consisting of a pint of tepid water containing a teaspoonful of boric acid may be taken daily for this trouble, and the external parts washed frequently with the same. To relieve the itching, cloths wet in a strong solution of baking soda and water may be laid on the itching parts, and this followed by the application of carbolized vaselin.

Nausea and vomiting are among the most common troubles of

the first months of pregnancy. The "morning sickness" is best avoided by the patient lying in bed until after breakfast, or for half an hour after a cup of hot milk or cocoa have been taken. Severe vomiting will require the services of a physician. Heartburn is frequent in pregnant women and is relieved by taking a teaspoonful of magnesia (Husband's) or baking soda in a glass of water.

Neuralgias often occur, particularly about the face; and also pain in the upper part of the back of the thigh, resembling sciatica, more troublesome on walking. A dentist should examine the teeth to see that the neuralgia of the face is not caused by a decayed tooth. If not so caused, then the rubbing on the painful parts of analgesic ointment (sold in collapsible tubes), or the application of a hot water bag may relieve the trouble. The pain in the thigh is due usually either to pressure of the child's head on the nerves in the back of the bony cavity (pelvis) of the mother, or to loosening of the joints at the base of the spine. If the patient assume a position on the bed, face downward and resting on the chest and knees until beginning fatigue, two or three times daily, the position of the child may change and the pressure on the nerves of the mother be relieved. This should more properly be done with the consent of the physician in charge. Sometimes the wearing of an abdominal support, as advised above, will give relief when there is looseness in the joints at the base of the spine.

Varicose or enlarged veins of the legs and thighs are natural consequences of pregnancy. Relief from the discomfort caused by them may be obtained by the use of the elastic stocking fitted by the makers of surgical appliances; or a flannel bandage about eight yards long may be made at home by sewing together strips four inches wide, and cut on the bias, into a strip. This should be wound into a roll and applied before rising in the morning. It should be started at the toes and wound from thence about the leg up to the top of the thigh and fastened there. After retiring at night the bandage is to be removed and rolled.

Excessive secretion of saliva is common in pregnant women and cannot readily be prevented. Frequent passage of urine is also usual, occurring more often during the first three or four months

from pressure of the child upon the bladder, and during the last two months from alteration in the shape of the bladder. This cannot be avoided, but if the urine becomes thick and cloudy the condition should at once be referred to the doctor. Cramps at night are annoying, attacking the legs. They may perhaps be averted by rubbing of the legs from below upwards before retiring.

Sleeplessness, more often during the later months, is occasionally vexatious. The use of a glass of warm milk or a glass of beer, before going to bed, or when wakeful at night, may be helpful. This means failing, sodium bromid (thirty grains) dissolved in a glass of water, and one-third of this taken at two, six and nine p. m. may relieve the trouble. More powerful remedies for the production of sleep should only be taken on medical advice.

During the last month of pregnancy the nipples should be bathed in alcohol, and glycerite of tannin should be then rubbed on them daily to harden the nipple. If the nipple is depressed and shrunken it may be pulled outward, but much manipulation of the breast is inadvisable as it stimulates the womb.

Every pregnant woman should have impressed upon her the fact that the appearance of certain symptoms should warn her to at once consult her doctor. These include the following: flowing of blood from the front passage or vagina, severe headache or pain in the stomach, dizziness and imperfect eyesight, nausea and vomiting during the later months, and swelling of the face and hands. These are, or may be, danger signals not to be neglected.

The mental state of the pregnant woman is often subject to change, and is one of the symptoms of her condition. Her character may be altered, and she may become irritable, suspicious, and difficult to live with. Only cheerful influences should surround her and the cares incident to business should be kept from her. She should also avoid any extensive social activity. Any marked unnatural mental state in the pregnant is of course unusual and a doctor should at once be consulted.

The shape of the child in the womb is not in any way influenced by unpleasant sights, frights, or impressions which its mother may have experienced during pregnancy; neither is its character changed



one iota by any specially delightful or uplifting influences to which the mother may subject herself, with this end in view, during pregnancy. Furthermore, there are no known means by which a doctor or any one may regulate, or even foretell the sex of the forthcoming offspring, notwithstanding popular teachings to the contrary.

The former idea that a pregnant woman should be left to shift for herself is fortunately passing. She should be under constant supervision of the doctor during the whole period of pregnancy in order that he may anticipate any trouble which may at times come on with great rapidity. It is the author's custom to see his pregnant patients weekly and secure a specimen of urine at those times. Most patients are able to come to his office.

### LIST OF ARTICLES FOR CHILDBIRTH

- One dozen clean sheets
- One dozen clean towels
- Four strips of unbleached cotton, one and one-fourth by one-half yard, for binders
- One strip of flannel, eighteen inches long by eight inches wide, for binder for the baby
- One rubber sheet, or piece of enamel cloth long enough to reach across the bed, and one yard wide
- One douche pan of the rectangular type, with a square shelf to put beneath the patient
- One fountain syringe
- One-half pound of absorbent cotton
- Four dozen pads for absorbing discharge
- Linen bobbin one-sixteenth inch wide, or very narrow tape one foot long for tying the navel cord
- One pair of scissors
- One bottle containing seven and one-half grain corrosive sublimate tablets
- One-quarter pound of boric acid
- Four cheap nail brushes wrapped in gauze, and boiled ten minutes
- One ounce of boric acid dissolved in one quart of water previously boiled and kept in a tight Mason jar
- Four ounces of brandy or whisky
- One-half ounce of fresh Squibb's fluid extract of ergot



- Two tubes of vaselin
- One cake of Castile soap
- Three agateware basins
- One slop jar
- One pan under bed for afterbirth
- Oilcloth or newspapers to spread on the floor under the bed to protect the carpet
- One gallon of water which has been boiled and kept in a clean pitcher covered with a clean towel and a gallon of hot water
- Baby's clothing and blanket to wrap the infant in

NOTE.—The pads which are worn after confinement are made of cotton batting wrapped in cheesecloth and are sterilized by being put into a slow oven and baked until they are a light russet brown. The pads should be all wrapped together in a piece of cotton and the package should not be opened until the pads are to be used, the rest of the pads being kept covered from dust. A sample pad covered with cotton cloth is put into the oven and, by observing this, one can decide when to take the large package out. The pads of cotton batting should be three inches thick, four inches wide, eight inches long, and wrapped in cheesecloth strips two feet long, each end of which is pinned to the binder about the patient.

#### BABY'S CLOTHES

- Four to six dozen diapers
- Four to six pairs knit woolen socks
- Three to four woolen shirts
- Four flannel night shirts
- Four flannel day skirts
- Four to six white day skirts
- Six to ten slips
- Six to ten dresses
- Four or five flannel bands
- Soft pillow, fourteen by eighteen inches
- Soft pillow covers
- Knit wrapping blankets
- Sacques, wrappers, bibs, caps, blankets, veils, etc.

NOTE.—All skirts to be made with waists instead of bands.

#### BABY'S BASKET

- Large and small safety pins
- Talcum powder, box, and puff
- Fine, soft sponge
- Soft brush for hair
- Castile soap
- Cold cream
- Alcohol for rubbing child

**BABY'S BASKET** (*Continued*)

Blunt scissors for nails  
Old linen for cleaning mouth  
Soft towels for bath  
Bath blanket  
Wooden forms for drying socks  
Wooden horse for drying diapers (Hirst).

**CARE OF THE MOTHER DURING CHILDBIRTH IN THE ABSENCE OF A DOCTOR**

The duration of labor averages about eighteen hours in the case of the first child, and about twelve hours in women who have already borne children. The time varies greatly in individual cases.

Moderate pain in the lower part of the back is usually the first symptom of labor, followed by severe pains, with intervals of rest, in the lower part of the belly. With the hand over the lower part of the belly the womb may be felt to harden with each pain. Some time before the child is born "the waters break," that is the membranous sac inclosing the child ruptures and the water escapes in which the infant has been floating. Occasionally the child is born in the sac (with a caul), so that it may be necessary to rupture it and remove the baby.

A full bath should be given the patient at the first intimation of labor, and the inside of the thighs, the lower part of the belly, and the external parts about the entrance to the front passage (vagina), as well as about the back passage, should be scrubbed with soap and water some ten minutes. The hair about this region should also be clipped or shaved. The giving of a soapsuds enema to empty the bowels is desirable also to make more room for the birth of the child. The bed on which the patient is to be delivered must be supplied with clean sheets and pillow cases. The bed should then be protected by laying a rubber sheet, enamel cloth or comforter, folded two feet wide, across the clean sheet in the middle of the bed under that section of the bed which will be occupied by the buttocks of the patient.

Then another clean sheet will cover this. After labor these will be removed and a pad of cotton batting and cheesecloth will be kept under the patient.

The patient may be encouraged to walk about from the time of the first pain until the membranes break or, when this happens early, until the child's head causes the parts to bulge about the outlet. The mother should not go to the closet during labor, as infants have been expelled during such times. Labor may be hastened in the later stages by the patient lying in bed, holding her breath, bracing her feet against the footboard of the bed, and pulling on a sheet attached to it during the pains. She should strain just as if she were trying to have a movement of the bowels. When the head of the child begins to show the patient should cease all straining.

The hands of the attendant should be absolutely clean. After cleaning her finger nails, she should scrub her hands and forearms for fully ten minutes with soap, warm water, and a scrubbing brush, and then rinse them in water which has been boiled.

When, by frequent inspection, it is seen that the child's head is so low down that the parts between the front and back passage bulge, and the head becomes visible during a pain, the patient is to be placed in bed upon her left side, with her thighs drawn up against her body and a pillow between her knees, and pressure should be made by the attendant's hand against the bulging parts to prevent the expulsion of the baby until the parts are properly stretched—so that they will not be torn during birth of the infant.

When the head is born see that the cord is not wound about the neck; untwist it if it is, and support the head. If the rest of the body is not soon expelled, press and knead the lower part of the mother's belly, forcing it out. If this does not succeed after ten minutes, extract the child by gentle force, pulling steadily on the child's head and freeing one arm at a time. As soon as the child is born an assistant should sit by the right side of the mother—and, pressing on the outside of the lower part of her belly, should grasp the womb between the thumb and fingers of the right hand and hold it firmly, kneading it if it gets soft, until the afterbirth

is expelled. Pressure must be kept up on the womb for half an hour after the afterbirth has come away as well.

Nothing in the whole care of the woman in labor is more important than the pressure on the womb to stop dangerous bleeding from this organ. It is absolutely indispensable, even if the pressure gives discomfort to the patient.

As soon as the child is born it is most vital that he shall breathe satisfactorily. If he does not breathe the cord should be immediately cut, but otherwise it is wise to wait three minutes in order that the infant may receive a few ounces more blood from the mother.

The baby may lie supported on the abdomen of the mother while the cord is cut. The cord is tied at two places; at a point two inches and at a point four inches from its attachment to the infant's body.

A clean, narrow piece of tape, or soft white string (which has been boiled five minutes), is wound about the cord tightly and tied securely at each of the above points so as to stop the bleeding after the cord is cut.

The cord is then severed midway between these two points with a clean pair of scissors which have been boiled five minutes. If any bleeding occurs from either cut end of the cord it should be stopped by tying another piece of tape about it.

Now if the baby does not cry or breathe freely, spank it gently and slap it on the soles of the feet. If this does not bring about the desired result try immersion in water. Into one of the basins provided pour water as hot as the hand can comfortably bear; into the other basin pour cold water. Grasping the infant by the feet and hands, immerse him, all but the head, first in one basin and then in the other, every few seconds. If after he has been thus dipped six times in each basin and he still fails to breathe, lay him on his back on the table, and raise his arms up above his head as far as possible, and after three seconds carry them down again alongside of his chest, making pressure on his chest with them just as in resuscitating a drowned person. During this process the baby should lie on a blanket in a very warm room.

Before the artificial breathing is done it is well to hold the baby



upside down by the feet for an instant, while the little finger (of the nurse) is introduced back into the mouth of the baby to clear away mucus and secretions interfering with breathing.

If this method fails then wrap the baby in a blanket and try "mouth to mouth inflation." This is done as follows: cleanse the mouth with a moistened clean towel. Put your little finger in the baby's mouth at one side to hold down his tongue. Place your mouth closely over his and blow into his lungs with your own breath, steadily and powerfully, so as to inflate the baby's chest. Count six slowly between the inflations while compressing the sides of the baby's chest after each inflation. In other words, one alternately fills the baby's chest with air and then forces it out by stopping the inflation and pressing in the lower part of the infant's chest. A baby who has thus been brought to life should be examined every ten minutes during the first twelve hours of his life, and if breathing fails again, the same process of inflation should be repeated. It will be seen that two attendants are desirable in childbirth, one to care for the mother and the other to look after the newborn baby. This of course may be impossible and in most cases, after the cord has been tied and cut, the baby is breathing normally and can be wrapped in a blanket and placed in his basket in a warm place out of the way, where he cannot be sat upon or harmed.

When two attendants are available one has, meanwhile, been sitting at the mother's side holding down and occasionally kneading the womb, and has also given the mother a teaspoonful of fluid-extract of ergot in one-third of a cup of water as soon as the child was born. This should be prepared beforehand so that it may be given the moment the child is born to prevent bleeding from the mother's womb, the danger most to be feared. The compression and kneading of the womb through the abdomen has a twofold purpose—to prevent bleeding and hasten the expulsion of the afterbirth. If the womb contracts rapidly and all bleeding ceases, the mother may fall asleep for a few minutes while the nurse still holds the womb. If over half an hour elapses after the birth of the child and the afterbirth has not come away, its delivery may be secured by pressing with force upon the lower part of the belly and kneading

the womb forcibly through the abdominal wall and so squeezing the afterbirth out.

But do not pull with any force upon the cord, which is a dangerous proceeding, as it may break. The afterbirth usually comes away in about fifteen minutes after the birth of the child, if the uterus is firmly compressed during this time. The afterbirth is caught in a basin together with the gush of blood which often follows it. When the afterbirth appears at the outlet it should be grasped by both hands and gently withdrawn, being careful not to break and leave behind the strip of membrane attached to it. This is best managed by moving the afterbirth up and down, with a rocking motion, while pulling it gently away from the mother.

### CARE OF THE MOTHER AFTER CHILDBIRTH

After the child and afterbirth have both been delivered the attendant must still sit by the side of the patient grasping her womb firmly through the abdominal wall for about one-half hour. The patient lies on her back during this time and should be kept on her back most of the time for the next week. After half an hour has elapsed, and the womb is felt to be hard and well contracted, the attendant should wash off the external parts about the vagina with warm boiled water or corrosive sublimate solution (one tablet to the quart of water), using one of the prepared pads as a sponge.

The binder is now tightly applied about the body, from below the breasts to a point below the hips, and snugly fastened with safety pins. It is well to lay a towel, folded into a square as large as the hand, under the binder and over the womb so that pressure will be made on the womb to replace that of the hand. A baked pad is now placed over the entrance to the front passage, and held in place by attaching each end to the binder by safety pins. The body clothing and bed linen must next be changed, with as little disturbance of the patient as possible. A clean sheet, folded three times (draw sheet), is laid across the bed over the under sheet and under the middle of the patient, and tucked in at its ends, to protect

the mattress. In addition, it is wise to keep a pad of cotton batting and cheesecloth under the patient's buttocks for the same purpose.

After this is completed the room should be darkened and the patient covered warmly, as a chill often occurs after childbirth, and she should be kept absolutely quiet, receive no visitors, and have three or four hours of complete rest. If there should be at any time much bleeding from the womb, firm pressure must be immediately made on the womb over the lower part of the belly, and kept up for half an hour, despite the discomfort to the patient and her remonstrances. Also give one-half teaspoonful of fluidextract of ergot hourly till four doses have been taken.

After four to eight hours of rest on her back the patient may lie on her side for a time, if she so desires, and the baby may be put to the breasts, first to one, then the other, at the same feeding, at four-hour intervals until the milk comes on the third day, and after this time the baby should nurse every two hours by day, with an interval of four or five hours at night. The first secretion of the breast before the real milk comes is laxative to the baby. No other food should be given the baby.

The pads on the mother should be changed as often as they become soaked with discharge and should not remain long enough to acquire any odor. Before applying a clean pad, and after urination and bowel movements, a pitcher of warm water containing corrosive sublimate (one tablet to two quarts) should be poured slowly over the external parts to wash off the blood and discharges while the patient is lying on a bedpan.

The urine should be passed once in eight hours. Considerable trouble is often experienced to get the patient to pass urine within this time after labor. One should not try to make the patient pass urine until twelve or even twenty-four hours after labor, if the act is difficult. At the end of that time various methods may aid the act. Thus allowing the sound of running water to reach the patient, placing hot cloths over the lower abdomen, permitting warm corrosive solution (as above) to flow over the external parts, and by giving an injection of one quart of warm water into the bowel, the urine may flow with the escape of the injection from the



rectum. If all these methods fail, and a physician is not available, the patient may be aided to sit upon a vessel, but this is to be avoided if in any way possible. Finally, if the patient is still unable to pass urine, the attendant must use a catheter and draw off the urine.

Pains in the womb after labor (after pains) are more common in women who have borne children. They mean that some clots remain in the womb and should be expelled to avoid their putrefaction. Kneading the belly over the womb and the use of hot poultices over the lower part of the belly are remedial.

The sickroom should be well ventilated and the patient should be sponged with warm water from head to foot once daily. The diet for the first two days consists of milk, broths, weak tea, and cocoa; for the next two days cereals, milk toast, soft eggs, soups, wine jelly, and one cup of tea or coffee. The meals should be served every two hours the first four days.

After the fourth day the diet should consist of simple food, as mashed or baked potatoes, toast or stale bread, soft eggs (boiled, poached or scrambled); chops, steak, roast lamb or chicken once daily; cereals, stewed fruits, and jellies. Then a gradual return to ordinary diet should follow.

In addition to the three chief meals a glass of milk should be given three times daily, between meals and at bedtime. Raw vegetables or fruit, except grapefruit, oranges or grapes, are undesirable.

The bowels are to be moved on the morning of the third day after labor by a half bottle of magnesium citrate, or a tablespoonful of Epsom salts in a whole glass of cool water before eating. If a movement does not occur four hours after the cathartic, an injection of soapsuds should be given. The bowels should be moved daily thereafter by laxatives as lapactic pills, one or two at night, or aromatic fluidextract of cascara sagrada, one-half to one teaspoonful at night. If the cathartic is not successful an enema of soapsuds should be given with the patient on a bedpan.

Giving a douche or injection into the front passage (vagina) is not advisable unless the discharge has a foul odor. Then an injection of two quarts of warm water, in which two corrosive



sublimate tablets have been dissolved, may be given with the patient on her back on a bedpan.

The breasts are apt to cause trouble on the third day or so, when the milk secretion is beginning. To avoid this, as the breasts become tense, full, and painful, they should be covered with a layer of cotton batting, and drawn together by a tight bandage eight inches wide, encircling the chest, and fastened in front by safety pins. The bandage is held up from slipping off the breast by straps of folded cotton cloth, two inches wide, passing over each shoulder and attached to the upper edge of the band about the body, before and behind. A piece of absorbent cotton should be laid between the breasts, and some talcum powder dusted in the crease, to prevent chafing and soreness. This should be done before fastening the bandage. The pressure of the bandage on the breasts prevents them from filling up and becoming painful, so it is essential that it be tight. An opening should be cut in the bandage over each nipple that the baby may nurse.

The nipples should be washed off with a solution of boric acid (as much as warm water will dissolve) before and after each nursing and then the nipples should be anointed with vaselin. A little absorbent cotton wound about a toothpick makes a good swab for washing the nipples.

If there are any lumps in the breast the bandage should be rubbed with the oiled hand, beginning gently and stroking the breast from the outside toward the nipple, when the milk will begin to flow, and after rubbing for a time the tenderness, great at first, will disappear with the lumps. Keeping warm, hot pads of cheese-cloth over the breasts, wet with strong boric acid solution, will also take the soreness out of the breasts. Constant pressure by a bandage in the first place is the best means of preventing soreness in the breasts and a few days after the milk has appeared this will usually pass away.

When the baby cannot nurse, because the milk disagrees with him or for any other reason, there will be more trouble with the breasts for a few days after the milk comes into them. The same treatment should be pursued, but a breast pump should also be used

two or three times a day, and the breasts kept tightly bandaged in the interim. Giving the patient two tablespoonfuls of Epsom salts the morning after the third day tends to reduce temporarily any oversecretion of milk.

If the breasts are actually inflamed and the skin reddened, or if there is throbbing pain in the breast and pain on moving the arm on that side, and fever, then nursing must be stopped in both breasts and an icebag or hot poultices should be applied to the sore breast and a surgeon summoned as soon as possible. Abscess or "broken breast" will be avoided in part by the measures already described, but another preventive means is the washing of the child's mouth and mother's nipples before and after nursing, with boric acid as described above.

Besides this the breasts should be kept absolutely clean with soap and water. Cracks in the nipples are the chief source of late abscess of the breast. If one occurs it should be touched three times a day with compound tincture of benzoin on a clean toothpick and use a nipple shield. The advice of a doctor is desirable. Both nipple shields and breast pumps must be washed and boiled five minutes after using, and be kept in boric acid solution when not in use.

No visitors, except the patient's mother and husband, are advisable during the time she is in bed.

The patient may turn freely in bed after the first week, and then it is advisable for her to lie for ten minutes night and morning with her back uppermost and resting on her knees, chest, and side of her face.

This position throws the womb forward and prevents it becoming displaced backward. If the patient will take deep breaths while in this position the effect is increased. A physician should examine every woman after childbirth at the end of two weeks and six weeks, to determine the damage done and the success of nature's repair.

The chief danger of childbirth—childbed fever—may be absolutely avoided by perfect cleanliness in regard to the patient, as has been described, and this applies all through the convalescence.

The nurse should always wash her hands thoroughly before touching the patient, while all clothing coming in contact with the patient should be scrupulously clean.

The occurrence of fever during the first week after labor is the first sign suggestive of blood poisoning and demands the immediate attention of a doctor. A scanty and foul-smelling discharge from the vagina is another bad sign.

The temperature should always be taken twice daily for ten days after labor and a temperature of 100° F. or over is a danger signal. The patient should stay in bed two weeks, pass the third week between the bed and lounge, and be dressed and go about during the fourth week after labor.

## CHAPTER XIII

### CARE OF THE BABY AFTER BIRTH

Immediate care after birth. Bathing. The skin. Clothing. Temperature. Ventilation and fresh air. Weight. Walking and talking. Bowel discharges. Teething. Nursing at the breast. Bad habits, including masturbation, sleeplessness, sucking, and bed-wetting. Preparing milk and other food for bottle feeding. Utensils used in bottle feeding.

#### IMMEDIATE CARE AFTER BIRTH

Immediately after tying the cord the baby's eyes should be cared for. It is always advisable to drop in each eye one drop of twenty-five per cent. solution of argyrol to prevent inflammation of the eyes and possible blindness. If argyrol is not at hand let boric acid solution (using as much boric acid as the water will dissolve) flow directly into the eyes from a cup, so that they are thoroughly cleansed. The use of argyrol solution with a medicine dropper is much to be preferred.

The stump of the cord attached to the navel is best dressed with salicylated cotton, or absorbent cotton, wet with alcohol, wrapped about it. The baby should be anointed from head to foot with warm sweet oil or vaselin, and placed in a warm spot, but not bathed for some hours. From time to time the baby must be watched to see that the navel cord does not bleed, and if it does, another piece of narrow tape or cotton string, previously boiled, should be tied tightly about the stump.

After a few hours the cheesy matter may be washed off the infant's body with warm water and Castile soap, the baby being held on the nurse's lap.



At the end of a week the baby may be bathed in a bathtub in water at 90° F., as shown by a bath thermometer. Until that time daily sponging may be done with water at 100° F., or, if the baby is feeble, he must be rubbed with warm olive oil instead. The dressing over the navel is kept in place by a loose, flannel binder. It is well to dust the navel cord with a mixture of salicylic acid (one part) and starch (five parts) each day. The cord should drop off the fifth day, and, if any raw spot remains, it should be cleaned by pouring on warm water, which has been previously boiled, and then dusted with dry boric acid and covered with clean absorbent cotton.

### BATHING

Bathing in the tub should be done in a warm room in the middle of the day and preferably in front of an open fire. First wash the head and face in water, without soap, and dry them. Then soap the body with Castile soap and place the baby in water in the tub at 90° F., and, while supporting his head and back, wash off the soap with a soft sponge. A cloth should be kept separate for use about the buttocks.

The eyes should be bathed daily with boric acid solution (one-quarter teaspoonful to one pint of boiled water). The best way is to drop the solution in the eyes with a medicine dropper. Any soreness or discharge from the eyes should demand the immediate attention of a physician as it may be a very serious matter.

### THE SKIN

Chafing is avoided by scrupulous cleanliness and changing of diapers as soon as soiled or wet; also by dusting in the folds of the skin a powder consisting of a mixture of starch (three parts) and boric acid (one part). Cold cream may also be used first on the chafed parts and the powder dusted on over this. If the skin is very delicate a bran bath may be used to advantage. This is made by tying one pint of bran in a bag of cheesecloth and placing

it in the baby's bath for five minutes, and then squeezing it out thoroughly in the bath. The bag may be dried and used again.

Drying should be done with a soft towel without rubbing. If there is a rash on the body it is wiser to omit the bath altogether until it is gone.

### CLOTHING

A bellyband, four inches wide and long enough to encircle the body and overlap four inches, should be worn during the first six months. After this a knitted band may be used for two years. Most babies are dressed too warmly in the house and the house is overheated. The thinnest gauze shirts are most suitable for summer, the next to the heaviest flannels in winter. Thick coats and leggings in winter, worn only when the infant goes out of doors, are better than heavy flannels worn all the time.

### TEMPERATURE

The nursery should be kept at a temperature of 68° F. during the day, never above 70° F. at any time, and not below 65° F. at night, for the first three months. After the first year the temperature may be as low as 40° to 50° F. at night.

The windows may be open at night after the first three months, except in the coldest weather. If the child is born in hot weather of course the windows may be open at any time. It is well to air the room after the bathing time and at bed time.

There should be no cooking, washing or drying clothes in the nursery, and there should be no unnecessary curtains, hangings or upholstery in the room, which should be large and sunshiny and heated preferably by an open grate. A gas stove for heating is unwholesome, except for temporary use for the bath.

### VENTILATION AND FRESH AIR

The baby may go out of doors in summer when one week old; in winter on warm days when three months old, if kept out of

the wind. A temperature below freezing, melting snow, or high winds, make outdoor airing inadvisable at this age.

At one month, airing of the baby in the nursery, while dressed and in the crib, may be begun, at first for fifteen minutes, later it may be continued for an hour. This may be done in all except the most severe and inclement weather. To accomplish the airing, the windows of the nursery should be opened as wide as possible, doors being shut, and a screen being used if necessary on account of draught.

When eight months old the baby may go out of doors in a carriage, if the temperature is not below 20° F. The best hours are in the middle of the morning and afternoon.

Sleeping while in the carriage in winter is allowable, if the wind and sun are not in the baby's face, and if the feet and body are well covered. The infant is as well off in a carriage as in the nurse's arms outdoors at any age.

Colds may best be avoided by keeping the nursery cool, by not overdressing indoors, and by bathing the chest and back with water at 60° F., while the baby sits in warm water, at the close of the daily bath.

## WEIGHT

The weight of a baby is the best guide in feeding and as to the general physical condition; therefore the baby should be weighed regularly every week. During the first week there is commonly some loss of weight—the baby may even weigh one-half pound less at the end of the first week than at birth. From the end of the first week to the sixth month the average gain should be from four to eight ounces a week; from this time until the end of the first year, from two to four ounces each week. An average baby should weigh twelve pounds at three months; fifteen pounds at six months; seventeen pounds at nine months; twenty pounds at the end of the first year.

The fontanel, or open spot in the top of the skull under the scalp, should close at eighteen months. The failure of the fontanel to

close at the end of the second year indicates some arrest in development which may be only due to previous malnutrition, or to some more serious developmental irregularity.

### WALKING AND TALKING

The baby holds up his head unassisted at the third or four month; sits up unsupported at the end of the seventh month; and stands without assistance at about the end of the first year.

At the end of fourteen or fifteen months a baby will usually begin to walk unassisted, although this is not to be encouraged. Baby usually begins to talk and say "mama" and "papa" at one year of age. If the child does not speak at all at the age of two there is a probability of deafness, or general arrest of development, which may prove the first sign of idiocy. There are of course many exceptions in the case of tardy development.

### BOWEL DISCHARGES

During the first few days after birth the passages from the bowels are blackish and sticky, but as soon as the baby receives milk they become of a creamy consistence and of a bright yellow color without much odor. The occurrence of white lumps or curds in the bowel movements is usually a sign that the milk is too rich in fat.

During the first weeks of life there are naturally from two to four movements daily. From two months to two years of age the movements normally number from one to three daily. After two years of age the passages become formed, and possess the characteristic odor of excrement. The appearance of blood in the discharges of the newborn is of serious significance. A greenish color of the movement often is characteristic of indigestion, but if the passage is of normal color when passed and later becomes green, the happening is of no significance.

Medicines, like bismuth and iron, stain the bowel movements



black, as also does blood in the upper part of the digestive tract. Clay-colored passages generally mean some obstruction to the flow of bile into the bowels. They accompany jaundice.

### TEETHING

Babies are teething from the fifth month until two and one-half years of age. At two and one-half years the first set of twenty teeth, consisting of six front teeth and four back teeth on each jaw, should have been cut. The two central front teeth on the lower jaw appear first, between the fifth and ninth month of life. The four upper central front teeth are cut between the eighth and twelfth month.

The remaining two lower front teeth and the four foremost back teeth (two on each jaw) come between the twelfth and eighteenth month.

The eye teeth (between the front and back teeth on the upper jaw), and the stomach teeth (in the same position on the lower jaw) appear between the eighteenth and twenty-fourth month. The four hindmost back teeth (two on each jaw) come between the twenty-fourth and thirtieth month. At one year there should be six teeth. At one and one-half years twelve teeth, at two years sixteen, and at two and one-half twenty teeth.

Although too much stress is commonly laid upon the digestive symptoms produced by the eruption of the teeth, there is no doubt that there is some connection between the cutting of the teeth and the various digestive disorders which usually occur at this time. At such times digestive disturbances which otherwise would be slight, are very apt to be severe.

It is, however, true that such digestive upsets are more often due to improper feeding than simply to dentition. At such time there may be fretfulness, increased drooling, and often a low grade of fever. The child puts his hand in his mouth; the gums are red and swollen, sleep is interrupted; the appetite is lessened and the

presence of curds in the stools indicate a decided interference with digestion.

### **NURSING AT THE BREAST**

After the mother has rested six to eight hours after childbirth, the baby may be put to the breast once in four hours for the first two days: After this the baby should nurse every two hours from seven a. m. until nine p. m., and twice during the night (two a. m. and five a. m.).

The baby should nurse at both breasts at each feeding, and should not be allowed more than twenty minutes for the whole nursing. While nursing the left breast the baby is held on his right side with his head resting on the left arm of the mother while the mother lies on her left side. The reverse is true when the baby nurses the other breast.

When the mother is able to sit up she should lean slightly forward and raise the breast with the fingers of the free hand to keep the weight from pressing against the baby's nose when nursing.

The baby should never sleep in the same bed with its mother. The mother may lie on the baby and she will be likely to nurse it too often.

### **BAD HABITS**

#### **MASTURBATION**

This will be considered in the Chapter on Sexual Hygiene.

#### **SLEEPLESSNESS**

The newborn babe should sleep nine-tenths of the time; an infant of six months should sleep two-thirds of the time if the digestion is good and the health normal.

The early habit of not feeding the baby after ten a. m. until five or six a. m. will do more than anything else to encourage sleep during the night. Rocking the baby to sleep and the use of the rubber nipple or pacifier are not to be recommended. Indigestion and overfeeding cause discomfort and sleeplessness.

If babies are taken up as soon as they cry they will not acquire the habit of sound sleep. A nervous temperament or excitement before bedtime will interfere with sleep. Insufficient fresh air, or too much or too little covering are inimical to sleep. Finally, general ill health or special diseases are common causes.

#### **SUCKING**

Sucking the thumb, blanket, or fingers, is detrimental to babies. Change in the shape of the mouth or fingers, infection of the mouth, and excessive flow of saliva which interferes with digestion, result from this habit. For this reason the use of the blind nipple, or pacifier, is inadvisable.

Placing mittens on babies and pinning their sleeves to their sides during sleep will prevent it. Nail biting is more apt to occur in nervous children and should be stopped. Dirt eating is seen in children as a result of various diseases.

#### **BED-WETTING**

After three years of age bed-wetting is abnormal. To prevent it give no fluid to the child after four p. m., and take him up at ten p. m. so that he can use the vessel. If the habit persists, a doctor should be called upon for advice.

### **FEEDING OF INFANTS FROM THE BOTTLE**

When a mother is unable, for any reason, to nurse her baby, the infant may usually be safely reared on cow's milk, so modified as to make the milk more suitable for the infant. Such feeding can be more intelligently directed by a doctor with experience in the care of children, but when such a doctor is not available, the mother or nurse should be able to take upon herself the task by following directions with care.

When one compares the composition of human and cow's milk one sees that cow's milk contains almost three times as much proteids, only half as much sugar, and about the same amount of fat as

human milk. The proteids are represented by the curd of skim milk, which separates on souring.

APPROXIMATE COMPOSITION OF COW'S MILK      COMPOSITION OF WOMEN'S MILK

Fat .....	4 per cent.	Fat .....	4 per cent.
Sugar .....	4 " "	Sugar .....	7 " "
Proteids or curd.....	4 " "	Proteids .....	1½ " "

The fat separates from milk and is found in the cream. There is about the same amount of sugar in skim milk and cream. Now hitherto the attempt has been made to modify cow's milk so that it will resemble human milk in composition; that is, to add cream to cow's milk, to increase the fat, and then dilute this mixture with water to lessen the proteids.

For example, suppose we use the upper half of a quart bottle of milk which contains ten per cent. of fat—while the proteids are unchanged; then to every ounce of this we add two ounces of water. This would give us a mixture containing three and one-third per cent. of fat and one-third of the normal percentage of proteids (one-third of four), or one and one-third per cent. of proteids—which would somewhat resemble human milk in composition. Then sugar would be added, as normal cow's milk is deficient in sugar, and when diluted with water would be greatly wanting in this ingredient. This has been the general principle of feeding babies in this country, but recent knowledge has brought about a change.

It used to be thought that the proteids or curd of cow's milk was the difficult part for infants to digest; it is now known, on the contrary, that the fat is most difficult of digestion, and that the apparent curds in the bowel discharges of infants are in reality a kind of soap formed in the bowels by undigested fat and alkaline digestive juices. This has led to the use of less fat in infant's milk.

It is also commonly taught that lime water should be added to milk because human milk is alkaline and cow's milk soon becomes acid. As a matter of fact, recent experiments show that such an addition does not increase the digestibility of milk. It has been found, however, that the addition of some starchy matter to milk,



as barley water and some of the malted foods, as malted milk and Mellin's food, does increase its digestibility. Some milk sugar may be added also, to bring the percentage nearer that in human milk, but this is not necessary.

There is no question that cow's milk is less readily digested and assimilated by infants than human milk because the milk of an animal is adjusted by nature to the needs of her young. The calf attains maturity in one-sixth the time required by the human being, and its need of proteids, which build flesh and bone, are great. The calf's stomach is much more complicated and capable of digesting in its four compartments food wholly unfit for the human being.

But, notwithstanding these drawbacks, babies will flourish on cow's milk properly prepared, while some calves will actually die on their own mother's milk—in the case of cows giving unusually rich milk, as some Jersey and Guernsey cows.

The most essential difference between human and cow's milk is that human milk is free from germs as it leaves the breast, whereas cow's milk teems with them. The germs in cow's milk are derived from disease of the udder, dirt of the cow, especially manure and dirty utensils, and also from contamination with human beings in handling the milk—which is a most excellent food for germs to grow in.

Thus from the cow the germs of tuberculosis find their way into milk, and also those germs from manure which are wholly responsible for the infant mortality from diarrheal diseases and so-called cholera infantum. Moreover, epidemics of tonsillitis, affecting many hundreds of persons, are caused by milk from cows with diseased udders. Through contamination of milk by persons employed to handle it, typhoid fever, diphtheria, and scarlet fever, are very commonly derived.

In New York to-day the health commissioner believes typhoid fever to be chiefly acquired from contaminated milk. In Boston, from 1907 to 1911 inclusive, the health authorities found 4,095 cases of disease caused by milk, as follows: 1,559 cases of scarlet fever; diphtheria, 72 cases; typhoid fever, 400 cases; and 2,064 tonsillitis cases.

Milk is unquestionably the chief cause of infant mortality. Dr. Goler, in Rochester, N. Y., by supplying clean milk to infants, reduced the average mortality in babies under one year, in July, from 1,000 deaths to 413 deaths, and to-day Rochester has the lowest infant mortality in the country, with the exception of Seattle.

A large percentage of tuberculosis in children is derived from milk. Rosenau states that from one-fifth to one-fourth of the tuberculosis of infancy and childhood is caused by milk. Theobald Smith concludes that one-half the cases of tuberculous glands in children are derived from contaminated milk. About ten per cent. of the samples of milk in our large cities contain the germs of tuberculosis derived from that disease in the cow.

The case against cow's milk is therefore sufficiently proven. How shall we avoid its dangers? There is only one certain method, and that is cooking. The more milk is heated the more is it altered. It has been found that even pasteurized milk fed exclusively for several months to babies may cause malnutrition, scurvy or rickets from destruction of unknown substances, called *vitamines*. By giving orange juice (containing *vitamines*) daily to infants absolutely no harm will result from feeding pasteurized or boiled milk.

For it is known that boiling does alter the milk chemically and physically in certain ways, and it is admitted that it is usually best to heat milk only to that point at which the germs are killed, with least alteration in the character of the milk (this temperature is 145° F.), when milk is kept at this point for thirty minutes.

Such heating followed by rapid cooling is called pasteurization. Only pasteurized milk should be given infants or children.

True, there is certified milk, that milk which is the cleanest possible to produce and which has led to great reduction in disease. But even in certified milk there is chance for contamination with human beings not known to be sick, but "carriers" of disease, and occasionally cows with tuberculosis are found in certified herds.

In fact, epidemics of scarlet fever have originated from certified milk, and the author has known of three deaths in infants from acute forms of tuberculosis due to the same supply of certified milk

and occurring at about the same time. In this herd about twenty per cent. of the cows were found to be tubercular. Of course this is a rare and unfortunate occurrence.

But from all that has been said it will be realized that raw cow's milk of any kind is far from a safe food, especially for infants living wholly upon it. While the most eminent authorities have found that the germs of all the special diseases are killed in milk heated to 145° F. for thirty minutes, yet there are many other varieties of germs in milk that survive this heating. These in large quantity may be harmful, and the products of the killed germs may also be harmful, so that it is always advisable that the milk be as clean as possible even if pasteurized. The ideal milk for infants is pasteurized certified milk.

There is no need for a special apparatus to pasteurize milk in, although the Freeman pasteurizer is an excellent one. After the nursing bottles have been properly cleaned and boiled, the proper amount of milk is placed in each bottle and a sufficient number of filled bottles for twenty-four hours' feeding, stopped with absorbent cotton, are placed in cold water in a kettle on a stove. The water should come well up to the level of the milk in the bottles, or as far as possible, and yet have the bottles stand firmly.

A perfectly clean dairy thermometer is then placed in one of the bottles of milk and, when the milk reaches 145° F., the vessel and contents should be taken off the stove and the whole covered with a blanket and allowed to stand for one-half hour undisturbed. If the temperature falls during this time the kettle should be kept on the back of the stove. The bottles are next removed and quickly cooled in cold water and placed in the ice chest.

Pasteurized milk should not be bought for babies, as the commercial pasteurization may be unreliable.

In a general way it may be said that milk from one cow is not so good for an infant as that from a mixed herd on account of variations in composition. There is a prevailing idea that any milk from a nearby farm is good, but farmers not engaged in selling milk in the city are apt to be poorly supplied with the machinery and facilities for properly handling it. Of course if milk can be



obtained fresh, so much the better, if it has been drawn in a cleanly manner. It should be cooled down to below 50° F. immediately or within two hours after milking.

The household should be entirely separated from the dairy, and neither the utensils or milk should ever be brought into a living apartment in the production of safe milk. Milk for infant feeding should be bought only in quart glass bottles, unless obtained from a nearby source, when the milk may be poured from a can into such bottles, which have been boiled, and placed in ice water to cool, before being set away in a refrigerator. The bottle may be covered by a clean, inverted jelly glass.

#### FEEDING DURING THE FIRST WEEK

**Feeding for the First Twenty-four Hours.**—Now as to the precise manner of using cow's milk for infants. During the first twenty-four hours of the baby's life nothing but boiled water heated to the temperature of the body, with a pinch of milk sugar, should be given—to the amount of three tablespoonfuls every four hours in a nursing bottle.

**Feeding after the First Twenty-four Hours.**—After this time skim milk may be fed pure. This should be first pasteurized, as described above, or boiled for one-half hour in a double boiler during the first three months, boiling the quantity of milk required for each twenty-four hours' feeding at one time each day.

The reason for boiling the milk the first three months is that then digestion is the weakest, and boiling milk has been shown to make it more digestible by causing the milk to form softer curds in the stomach and by preventing the fat globules in milk from coalescing, as otherwise will occur.

Skim milk is used the first week because at that time woman's milk is naturally poor in fat and sugar.

#### FEEDING DURING THE SECOND WEEK

At the end of the first week a mixture consisting of one-third whole milk and two-thirds skim milk may be used. This whole milk



should be milk poor in fat or that containing only three per cent. of fat.

Now ordinary milk contains, as we have seen, about four per cent. of fat. Rich milk contains five per cent. of fat. The amount of fat in the milk may often be ascertained from the milkman, but more accurately by telephoning the city chemist, who is required to examine all samples from venders of milk, at regular intervals. In the country a creamery will determine the fat in milk at slight expense. If one cannot readily ascertain the amount of fat in the milk, it is safer to consider it richer than it probably is before diluting it.

The following directions will enable one to make a milk containing three per cent. of fat from a richer milk. From milk containing four per cent. of fat remove the upper one and two-third ounces of cream from a quart bottle, after it has stood four hours or more. Remove the upper two and one-half ounces from milk containing four and five-tenths per cent. of fat, and remove the upper three and one-half ounces from milk containing five per cent. of fat, to reduce it to milk containing three per cent. of fat, which is what is spoken of hereafter as whole milk. No richer milk should be fed a baby.

The skim milk is obtained by dipping off the cream, with a Chapin dipper, from the top of a bottle after the cream has fully risen.

#### FEEDING DURING THE FIRST SEVEN MONTHS

At the end of the second week one-half of skim milk and one-half whole milk may be used; at the end of the third week three-quarters whole milk and one-quarter skim milk; and at the end of the first month whole milk containing three per cent. fat may be fed undiluted.

It must not be expected that the baby will begin to gain with this method of feeding until the third week or so, but it is safer than using the richer mixtures. In some cases the digestion is so poor that artificial digestion of the milk may be necessary, as described below.

The feeding with whole milk may be pursued until the infant

is seven months old when the addition of cereal food is advisable. This method of feeding is exceedingly simple as compared to that hitherto in vogue, and is based on the most recent investigations and upheld by the United States Public Health Service and large experience. Cow's milk for babies must always be pasteurized (pp. 242-3) or boiled, and orange juice must also be given (p. 255). Whole milk contains enough natural sugar. When milk is much diluted, milk sugar or malt sugar to the amount of one level tablespoonful in the twenty-four-hour milk mixture may be added. Peptogenic milk powder contains milk sugar.

The quantity of milk at each feeding and the intervals between feedings are shown in the following table:

*Schedule for feeding healthy infants during the first year.\**

Age.	Interval between meals by day.	Night feedings (10 p. m. to 7 a.m.).	Number of feed- ings in 24 hours.	Quantity for 1 feeding.	Quantity for 24 hours.
	<i>Hours.</i>			<i>Ounces.</i>	<i>Ounces.</i>
Second to seventh day . . . . .	3	1	7	1½-2½	10-17
Second and third weeks . . . . .	3	1	7	2 -4	14-28
Fourth to ninth week . . . . .	3	1	7	3 -4½	21-31
Tenth week to fifth month . . . . .	3	1	7	3½-5	24-35
Fifth to seventh month . . . . .	3	0	6	4½-6½	27-39
Seventh to twelfth month . . . . .	4	0	5	6½-9	33-45

\* From "Care and Feeding of Children," L. Emmett Holt, M. D.

Some doctors feed at four-hour intervals from the beginning, but in many cases the infant will not get sufficient nourishment to thrive with these longer intervals.

After the third week there will be one feeding between ten p. m. and seven a. m.; but often a more convenient arrangement may be made so that the infant may be allowed to sleep between the last feeding at nine or ten p. m. and the first feeding early in the morning at five or six a. m., and this custom may be established by habit and by only giving warm water in the middle of the night if the baby awakes.

The amount of cow's milk in twenty-four hours required by

an infant is that equal to one-seventh of the body weight—up to three months of age; and after that an amount equal to one-eighth of the body weight. Thus if a baby one week old weighed seven pounds, he would require sixteen ounces, or one pint, of whole cow's milk in twenty-four hours. A baby of four months weighing twelve pounds would require one-eighth of this, or twenty-four ounces of whole milk (three per cent. fat) in twenty-four hours.

The greatest trouble in feeding infants artificially will occur in the first few months. If babies have been on the breast for some months and then are fed cow's milk, it is better to begin the bottle feeding the same way we begin with infants in the first week, i. e., with skim milk and gradually add the whole milk until a whole milk containing three per cent. fat, as above, is fed.

When skim milk does not agree with newborn babies and there is much restlessness and crying, and the baby is constipated, and the movements are clay-colored or green, it may be necessary to increase the digestibility of the milk by adding to it what is called Peptogenic Milk Powder. This partially digests the milk before it is taken.

One need not follow the directions on the maker's bottle, but add one measureful, mixed with a little cold water, to the skim milk for twenty-four hours' feeding. The milk should be previously warmed to about the temperature of the body in a double boiler, and then the milk should be allowed to stand in the boiler off the stove, and the powder added and stirred in with a clean spoon. After the powder has been in the milk for ten minutes the boiler should be placed on the stove again and the milk boiled and then cooled in the double boiler in cold water, and poured into the individual nursing bottles which are to be used for the next twenty-four hours. It is not necessary to use more than one measureful of the powder even if the amount of milk required is greater than that given in the directions for the use of the powder, and the milk need not be boiled more than a minute.

If this predigested whole skim milk does not agree with the infant, one may begin by using the powder in half skim milk and half water, adding an ounce more of skim milk daily in place of



an ounce of water. When all skim milk is used, then one may begin to add whole milk in place of skim milk, as advised in the feeding of normal infants during the first month.

After using the powder for several months it may be dropped without any bad effect in most cases. The writer has had great success in feeding babies with delicate digestion by this plan.

In cases of difficult digestion where the milk with the peptogenic powder does not agree, the milk may be diluted with barley water, prepared as directed in Chapter XIV, and the powder discontinued.

Of course the only proper and sensible procedure consists in employing a doctor to prescribe the food for all infants.

#### **FOOD IN ADDITION TO MILK ALLOWED THE FIRST YEAR**

Only quite recently has it become generally recognized that infants may digest starchy food perfectly in the early months. Ordinarily the cereals are not added to milk until the seventh month, but they may be used as early as the second month if the pure milk does not seem to agree. They prevent hard curding of milk in the stomach and overcome constipation.

When begun at the second month only a few ounces should be used to replace the same amount of milk in the twenty-four-hour supply. If this agrees well, the amount of cereal may be increased until it forms one-third of the whole of the food. The flour of barley, wheat or rice is used. Robinson's or Brooks' barley flour is most often given.

#### **UTENSILS NECESSARY FOR PREPARING INFANTS' FOOD**

One dozen round or flattened nursing bottles

One dozen black rubber nipples

One eight-ounce measuring glass

One brush for cleaning bottles

One one-ounce Chapin dipper, for removing cream from top of a quart milk bottle

Some absorbent cotton for stoppering nursing bottles

Two wide-mouthed bottles for baking soda and boric acid.



One tall quart cup in which to heat separate nursing bottles before each feeding

One ordinary kettle for holding bottles necessary for twenty-four hour use

One small glass funnel for filling nursing bottle.

NOTE.—The nursing bottles should have a gradually sloping neck so as to be easily cleaned. Those bottles (Hygeia) without any neck and having a wide nipple are good, but the nipples are more expensive.

The black rubber nipples referred to in the above list should either be straight or with ball-like top, with three small holes through which the milk will just trickle.

### DETAILS OF PREPARATION OF MILK AND CARE OF UTENSILS

In order that cream should properly rise on milk it should stand in the ordinary one-quart glass milk bottle four or five hours in a cool place. If the milk is delivered in a glass milk bottle and the cream has already risen it may be removed at any time, or enough to make a three per cent. milk.

When the skim milk is to be used the cream should all be dipped off with the milk dipper, or the skim milk should be drawn off through a siphon made of a bent glass tube with one end four inches longer than the other.

It is difficult, however, to keep these glass tubes clean and the dipper is advised. Pouring off the cream from the bottle is not to be done because the cream and milk become mixed in the process. Enough milk should be placed in bottles at one time to last for twenty-four hours.

That there may be no misunderstanding as to details we will suppose that we are beginning to feed a newborn babe. We do not begin to feed milk until the second day. Before this time the baby should receive only sugar water, as described above.

Supposing that we begin with the feeding of skim milk, as advised above, we must first separate the cream from a quart bottle from the skim milk and boil the skim milk as described. Then, according to our table above, there will be ten feedings in twenty-four hours of one to one and one-half ounces each. Eleven bottles

(as the contents of one may be spilled accidentally), each containing one and one-half ounces, or sixteen and one-half ounces, of skim milk for the twenty-four hours should be prepared.

In this case all that is necessary is to pour the boiled milk, after it has been cooled in cold water, through a glass funnel into the nursing bottles to the point marked one and one-half ounces, plugging the mouth of each bottle with absorbent cotton, and placing the bottles on ice.

The bottles may be kept in racks sold for the purpose, or placed in a bread tin to keep them from toppling over. It is always wise to taste the milk before making up the twenty-four hour quantity to be sure that it is not sour.

Feeding is begun at six a. m. and continued with regularity every two hours till ten p. m. When about to feed the baby, the bottle is taken from the ice and warmed by standing it in a tall quart cup of warm water. The temperature of the milk should be 100° F., and it should feel slightly warmer than the temperature of the body.

A flannel cover should be used to keep the milk warm while the baby is nursing. The nipple should be tested after it is attached to the bottle to see that the milk flows properly, that is, drops rapidly from the bottle. A baby should not be allowed to nurse more than twenty minutes at a time; at the end of this period the bottle should be taken away. Jouncing or disturbing the baby after eating does harm in causing vomiting and indigestion. The baby should be placed quietly in his crib.

In regard to the quantity of milk suitable for each feeding, it may be said that the larger amounts may be given to the larger babies having strong digestions. If a baby evidently wants the larger amounts given in the table above (p. 246) and the food agrees with him, it will be proper to continue with the larger quantities.

During the first two months babies should be held in the arms of the nurse when fed, except at night. After this time the baby may lie on his side in a crib while the nurse holds the bottle bottom side up. An infant must be wakened at the appointed time for

feeding during the day but may sleep as long as he will without being fed at night.

After each nursing the bottle should be immediately rinsed in water and left standing, filled with water containing one-half teaspoonful of baking soda. Once daily all the bottles should be washed inside with brush, soap and hot water, and then boiled for twenty minutes in plain water. To prevent new bottles from being broken by boiling they should be placed in cold water, and then the water should be brought to the boiling point, and the bottles allowed to remain in the water until it again becomes cold. This process is called annealing.

The nipples, when not in use, should soak in a solution of boric acid (as much of the acid as the water will dissolve) until such a time of day as they may be all turned inside out and washed with hot soapsuds. They may be boiled for five minutes when new but not after this, as the rubber will be ruined.

All vessels which come in contact with the baby's milk must be washed and boiled before use. This category includes the two-quart bottle for mixing skim milk and whole milk, the dipper for removing cream from milk, the spoon used for mixing the food, etc. Any portion of the food left in the bottle after nursing should of course be thrown away.

The difficulty of feeding babies lies in the fact that no two babies are alike in their response to food. It is always safer to underfeed than to overfeed. The mother thinks only of getting more nourishment into her baby, especially if the infant is ailing and losing weight. But an amount of food less than necessary for the baby's requirements is infinitely better than overfeeding, which may upset the digestion so that no food will be tolerated for a considerable period.

As long as the baby is gaining satisfactorily and the bowel discharges have a normal yellow color, are of proper soft consistency, without curds, and the number is not above two or three in twenty-four hours, the food is satisfactory and need not be changed. But if the gain in weight is not satisfactory, as shown by weekly weighings, and the bowel discharges are normal, but the baby



is crying for more food, then it is high time to increase the food.

On the other hand, if the baby is overfed he may vomit, be fretful, and have colic and wind; the bowels will be constipated and the discharges pale and dry; the appetite may be poor or good and the baby may lose weight. Then is the time to cut down the diet. If skim milk alone is taken it may be necessary to dilute this a third or a half with water. If whole milk, or whole milk and skim milk, are being fed, the diet may be reduced to skim milk alone. This should be continued for a few days until the milk becomes normal again and the milk should slowly be increased in strength. It is not advisable to increase the strength of the food oftener than once in a few days.

When the infant is overfed it is wise to give a teaspoonful of castor oil at the same time the food is reduced. In the case of severe vomiting and diarrhea in babies, all milk should be stopped for twenty-four hours and only barley water, whey, chicken broth, or white of egg and water should be given; the bowels should be washed out with injections of salt and water (one teaspoonful to the pint). Milk should not be given again until the bowel discharges begin to look normal and then only boiled skim milk should be employed for several days. If the baby's appetite is poor, but he seems otherwise well, the intervals between the feedings should be increased by an hour or two.

If the baby is stricken with fever or acute disease of any kind, as measles, a bad cough, etc., the food should be diluted with one-third to one-half of boiled or barley water.



## CHAPTER XIV

### FOOD FOR INFANTS AND THE SICK

Including barley and oatmeal water, barley gruel, beef juice, orange juice, water, egg-white, coddled egg, meat broths, albumen or egg water, whey, scraped beef, beef tea, peptonized milk, junket or milk curd, milk porridge, soft custard, egg nog, clam broth, oyster broth, condensed milk, patent or proprietary foods. Diet for children from first to sixth year.

As many of the following receipts are useful for sick adults as well as babies we will include them in a separate chapter.

**Barley and Oatmeal Water.**—Stir one level tablespoonful of Brooks' barley flour into cold water to make a thin paste, and add this gradually to one pint of boiling water in a double boiler; boil twenty minutes.

Sometimes only one teaspoonful of barley is used in the beginning for infants. Whole barley is sometimes employed; it is washed and soaked in cold water over night. This is drained off in the morning and fresh cold water is added (one and a half tablespoonfuls to the quart), and the whole boiled for four hours in a double boiler, down to a pint, adding water as need is indicated. Strain through muslin.

Oatmeal water is made in the same way as barley water except that the cooking should be done for an hour, and enough water added from time to time to make up for that which has been evaporated. It may be used instead of barley water for infants, and is beneficial in constipation. Rice or wheat flour may be cooked and used in the same way as barley for infants.

Barley water may be fed infants first in the weaker receipt, noted above, and then gradually increasing its strength to one tablespoonful to the pint. The milk may be diluted one-third, and when

this is done the whole cow's milk may be used without removing any cream. Even the richest milk would contain but a trifle over three per cent. of fat when so diluted.

When this does not agree with infants the starch may be partially digested or dextrinized. The cereal water is made as described and, when cooled to blood heat, one teaspoonful of taka-diastase or of cereo or Forbes' diastase (obtainable of a druggist) is added to a pint, which is allowed to stand for fifteen minutes before being added to the infant's milk. The starch is thus partially digested, and the mixture is suitable for infants with delicate digestion.

**Barley Gruel.**—Two tablespoonfuls of barley flour are mixed with cold milk in a double boiler into a thin paste and stirred into a quart of boiling milk, with sufficient salt, and cooked for two hours. Instead of milk, barley flour may be added to the broth in the same proportion and cooked for one-half hour and strained. These receipts are suitable for sick children or adults.

Another easily digestible and palatable receipt for adults is made by beating a whole egg and adding a tablespoonful of sherry, a teaspoonful of lemon juice, and sufficient sugar and powdered nutmeg to a whole cupful of hot gruel. Gruels of wheat and oat flour may be made in the same way.

**Beef Juice.**—Broil slightly some steak from the rump or upper part of the round for one or two minutes and squeeze out the juice with a lemon squeezer, press, or potato ricer, into a warmed cup. Beef juice may be given to normal babies after the eighth or ninth month. For pale and anemic infants it may be begun as early as the sixth month.

It is given with an equal amount of water about five minutes before the regular milk feeding. Beginning with a teaspoonful of beef juice it may be gradually increased every three or four days, until at the end of two or three weeks two tablespoonfuls are given once daily at one time.

One-half pound of lean meat passed through the Enterprise Chopper may be made into a flat mass and broiled until slightly brown and the juice extracted with a press. The juice may then

be mixed with an equal part of barley water. This forms a good diet with broths for infants with diarrhea who cannot take milk. Only enough juice should be prepared for one feeding at a time. Beef juice is excellent for adults with fevers and digestive troubles.

**Orange Juice.**—Milk for all babies (who are not nursing at the breast) should either be pasteurized or boiled and, at the same time, orange juice should be given to prevent scurvy, rickets and malnutrition that may result from heating the milk (destruction of vitamine, pp. 242-3), and also to secure a laxative action.

Beginning when the baby is three weeks old one teaspoonful of freshly squeezed orange juice should be given three times daily—gradually increasing the amount to three tablespoonfuls three times a day. Some doctors boil the orange juice a few minutes, but this is not essential.

**Water.**—An infant should have pure, cool water to drink from the time of its birth, whether fed from the breast or bottle. The water, unless analysis has shown it indubitably pure, should be boiled daily and kept cool in a fruit jar. During the first year water should be given three times daily with a spoon, cup or nursing bottle. From the beginning of the second year from one to four ounces should be given between meals.

**Egg-white—Coddled Egg.**—Boiling water is taken from the stove and an egg is placed in it; at the end of ten minutes the white of the egg is softly coagulated. This may be used in place of beef juice for variety in the diet of infants after the sixth month. One-half the egg-white may at first be given once daily and, at the end of a week, the whole white may be taken.

Broths, albumen water, and whey, are often given babies alternately in place of milk during an attack of digestive trouble with vomiting or diarrhea.

**Veal, Chicken, Beef, or Mutton Broth.**—The flesh of a knuckle of veal, two pounds; or a chopped chicken, bones, and all; or two pounds of round of beef or neck of mutton are added to a quart of cold water and soaked for half an hour in a tightly covered agateware kettle.

The meat should be wiped off with a damp cloth, and cut into



small bits, and the bones broken into small pieces. Then after soaking the meat in cold water the kettle is placed on the fire and the broth brought slowly to the boiling point. This should boil but a few moments, and then the kettle should be moved to the back of the stove and allowed to simmer (170°, 180° F.) for two to six hours, or until the meat is colorless and in rags. Strain, and, when cool, remove the fat. Heat in a double boiler when this is used, and flavor to taste.

Two tablespoonfuls of barley flour may be added to a quart of broth to increase its value (*See Barley Water*). For invalids vegetables (onions, carrots, etc.) may be cut up and added an hour before the soup is taken from the fire. When it is desired to thicken soups for invalids, as chicken soup, two teaspoonfuls of flour should be stirred slowly and thoroughly into melted butter in a cup over the fire. Then enough soup is poured into the cup to make a very thin mixture and this is slowly stirred into a pint of boiling soup.

Broth may also be mixed with an equal quantity of milk, and the whole brought to a boil and thickened, as described. Chicken broth is agreeable served in this manner. Only the plain unthickened broths, veal, chicken, beef or mutton, however, are given infants. They may be taken in a nursing bottle.

For invalids a strong beef broth may be made from one pound of beef and one pound of bone cooked, as described above, eight hours in one quart and one-half pint of water. When strained off and allowed to cool, the jelly may be eaten or the broth heated in a double boiler but not to boiling. When meat is not obtainable a nutritious broth may be made by stirring a raw egg into water as hot as can possibly be swallowed (140° F.) and flavoring with salt or a little beef extract; or the yolk and white of an egg are beaten separately and the yolk stirred in hot broth, which is flavored with salt, and then the white is stirred in and the whole reheated as hot as can be swallowed. Liquids can be taken as hot as 140° F., but 122° F. is a more agreeable temperature.

**Albumen or Egg Water.**—Stir the white of one egg into one-half pint of water which has been boiled and cooled. Albumen



water may be taken from a nursing bottle by infants and may be sweetened with a teaspoonful of milk sugar.

White of egg is very frequently given to adults in fevers and when the digestion is weak. It is given in various ways: the white of an egg may be beaten with a cup of cold water and flavored with a little lemon juice or sherry and sugar.

**Whey.**—Warm one pint of pasteurized milk to blood heat, add a pinch of salt, a teaspoonful of sugar, and two teaspoonfuls of liquid rennet, or a rennet tablet dissolved in water, or two teaspoonfuls of essence of pepsin.

Allow the milk to stand in a warm place until a complete curd forms; then beat the curd with a fork and strain off the liquid, or whey, through muslin. If the curds are well beaten the whey is richer in fat. Follow the directions on the rennet bottles as different preparations vary in strength. To make it more nourishing stir the white of an egg into a glass of whey.

Broth, albumen water and whey are alternated and given to infants at the ordinary times of milk feeding, which they should replace when there is vomiting and diarrhea.

For adults whey may be separated with lemon juice or sherry, which gives it an agreeable flavor. One cup of milk is boiled in a double boiler; two tablespoonfuls of lemon juice or three of sherry are added and the milk is cooked, without stirring, until it curdles. Strain through cheesecloth and add sugar. This may be served hot or cold.

**Scraped Beef.**—Lay a piece of tender, raw steak (free from fat), one-half an inch thick, on a board and scrape away the pulp with a sharp knife until only tough, stringy fibers are left. The meat may also be prepared by using a grater or Enterprise Chopper, and then by pounding the pulp in a mortar and passing it through a sieve, and seasoning with salt.

It may be fed babies, after rubbing the pulp with water until it has the consistency of fine cream, giving a teaspoonful at a time. For adults the scraped pulp may be made in cakes one-half an inch thick, seasoned, and broiled two minutes, and served on buttered toast.

**Beef Tea.**—This is made as recommended for broth. One-half a pound of fat-free rump or round steak is cut into small pieces and placed with a cup of cold water in a double boiler for fifteen minutes. Cold water is then placed in the outer part of the boiler and the whole should be set on the fire.

The cooking should be done slowly and the beef tea should be heated to a point not above 150° F. for two hours. Beef tea is strained off, but the more fine the particles of meat in it the better. Fat should be removed when cold, or a piece of bread may be laid on top of the beef tea to absorb it. It is even better to cook beef tea six hours when there is time.

To make beef tea rapidly, place one pound of scraped beef, free from fat, in a covered enameled saucepan, and pour half a pint of boiling water on it; cover and put on the back of the stove for ten minutes. Strain into a tea cup; place the cup in cold water, and skim off the fat when cold. Warm and season to taste.

Beef tea is a stimulating preparation for invalids but does not contain much nourishment. It is not given to babies. By simmering it for many hours there are more particles of flesh, and therefore more nourishment in the beef tea.

**Peptonized Milk.**—This is useful for babies when they vomit milk or do not digest it well, as shown by gray, white, or greenish bowel discharges, pain, flatulence, and constipation.

The peptogenic milk powder is especially prepared to digest milk for babies, and therefore contains sugar of milk. But Fairchild's peptonizing powders may be used for digesting milk for adults, when the digestion is so poor that little food is retained in the stomach, and they may also be employed for infants if it is not desired to use sugar of milk. The peptonizing powders are sold in little glass tubes. The contents of one of these tubes is to be rubbed up with a little milk in a cup and then poured into a pint of milk, which has been previously heated to the temperature of the body (98° F.) in a double boiler. The milk is kept at the same temperature for ten to twenty minutes and then, unless to be used at once, is immediately boiled or placed on ice. If the milk were kept warm artificial digestion would go on until the milk was

bitter and unpalatable. Heating or cooling the milk stops the digestion.

If less than a pint of milk is desired a fraction of the powder may be used at a time, according to the amount of milk used. In giving the peptonizing powders to babies one-sixth of the contents of a tube may be mixed with cold water in a spoon and added to each bottle of milk just before feeding the baby. Then the bottle is heated to blood heat, as usual, but the powder is allowed to remain in the milk ten minutes before the bottle is given to the baby.

It may be used during the first few months for infants with weak digestion, or during attacks of acute indigestion. For infants, however, Fairchild's Peptogenic Milk Powder is usually more suitable.

**Junket or Milk Curd.**—This is made as in the preparation of whey with the exception that in this case the curds are not beaten to separate the whey, but the curd when formed is cooled in an icebox and eaten with sugar and cream and grated nutmeg on the top.

To increase the nutritive value of the curd a whole egg, beaten to a froth with two teaspoonfuls of sugar and of rum, brandy or wine, may be stirred into the warm milk before adding the rennet. Or two or three tablespoonfuls of boiled coffee or cocoa may be added for flavoring to each cup of milk before using the rennet.

Junket is a pleasant article of food for a convalescent or adult with weak digestion or fever, and is used (plain) as a regular addition to the diet of infants over a year old.

**Milk Porridge.**—Stir one tablespoonful of flour in a saucepan with a little cold milk until free from lumps, and then gradually add one-half pint of boiling milk while stirring. Boil a few minutes.

This is very useful for adults and older children with diarrhea, eaten with cream and sugar, and may be alternated with boiled rice and milk toast.

**Soft Custard.**—Scald a cup of milk in a double boiler. Beat the yolk of two eggs with teaspoonfuls of sugar, and salt to taste. Add gradually to scalded milk and stir until the mixture becomes creamy and free from froth. Remove from fire and cool, adding vanilla, or orange or lemon extract.



Soft custard is a very nutritious and digestible dessert for children or invalids, and may be eaten with bread broken into it.

**Egg Nog.**—Scald some milk, but do not allow it to boil. Beat up the white of an egg to a stiff froth, and then beat in the yolk, a little sugar, and two teaspoonfuls of sherry, brandy, or rum. Stir the egg into a glass two-thirds full of the cold scalded milk.

Owing to the richness of the yolk persons soon tire of this and, for most invalids, it is best to only use the white of egg with milk. The white of egg may be first beaten alone or beaten with the milk, and the stimulant, sugar or salt then added.

**Clam Broth.**—Scrub and wash a dozen clams thoroughly, changing the water several times. Place in a saucepan with two table-spoonfuls of water, cover and cook until the shells open. Then take the clams from the shells, allowing the water in the shells to run into a saucepan. Strain the clam juice from the saucepan through two thicknesses of cheesecloth and serve hot with a little butter, and bread crumbs. This is an appetizing broth for an adult but contains little nutriment.

**Oyster Broth.**—Mince one pint of oysters, and add to one-half pint of cold water. Let this simmer for ten minutes; skim, strain, and serve hot with pepper and salt. This is similar to clam broth and may be used for adults with acute indigestion and fevers.

**Condensed Milk.**—Unsweetened, sterile condensed milk is an excellent substitute for fresh milk when that is unobtainable. Many infants have been fed successfully on it, but orange juice should always be given with any form of dried or condensed milk (p. 255). Carnation milk contains double the percentage of constituents in fresh milk, as half the water has been evaporated. It should be diluted with 6 parts of water—gradually adding more milk until only 4 or 3 parts of water are used. With 3 parts of water it contains 3 per cent of fat. Mammala is a good substitute for milk in powder. Sweet condensed milk contains too much sugar for babies, but in emergencies may be given as follows: 1 part in 13 of barley water at 1 month; 1 part in 11 of water at 2 months; 1 part in 10 of water at 3 months; 1 part in 8 of water at 4 to 6 months; 1 part with 6 of water for older children.



**Patent or Proprietary Foods for Babies.**—The patent foods are not essential, and used injudiciously they have been the cause of more disease among babies than any other food except impure milk. The strained gruels take the place of these and, if it is desired to make them more digestible, taka-diastase may be added. Some of the patent foods, as Mellin's food and malted milk, make an excellent addition to cow's milk, but the trouble has been that too much reliance has been placed upon the nutritive value of the foods.

The use of the ordinary cereals, as barley water, is much cheaper than patent food and it is wiser to rely upon only such foods as may be advised by the doctor. Some of the patent foods are unfit for any baby, and all are bad when used unwisely.

Urging or bribing children to eat, or amusing them while at meals, are useless and harmful practices. Such methods will not improve a poor appetite and they encourage the tendency to play with food. If, when the proper food is placed before a child he will not take it or dallies complainingly with it, remove it at once and give him nothing between meals, and repeat the same procedure at subsequent meals. Hunger will quietly and forcibly accomplish what cajoling and talk never will, and the child will come to recognize the proper times for eating and proper kinds of foods as the only ones.

#### DIET FROM TWELFTH TO FIFTEENTH MONTH

At twelve to thirteen months all normal babies should be weaned from the bottle and made to take food from a cup or spoon, though up to the eighteenth month the child, as a matter of convenience, may have the ten o'clock feeding from a bottle. The importance of weaning from the bottle at this time is often overlooked, and if the child is allowed to continue on chiefly a milk diet for two years he will suffer from lack of sufficient solid food and become weak and pale.

Five meals should be given daily—at six-thirty and ten a. m., and at two, six and ten p. m. These should consist of milk, which should be pasteurized from June first to October first, except that at the third meal three to four teaspoonfuls of beef juice, or a cup of beef, mutton or chicken broth, or a soft boiled egg and a slice

of toast may be given in addition to half the usual amount of milk. The juice of fresh fruit, as orange or peach, should be given once daily an hour before the regular time of feeding.

## DIET FOR CHILDREN FROM FIRST TO SIXTH YEAR

### DIET FROM FIFTEENTH TO TWENTIETH MONTH

*Six-thirty a. m.:* Six to eight ounces of warm, certified milk, pasteurized during the summer months, with two to three ounces of oatmeal or barley gruel.

*Nine a. m.:* Orange juice, two to three ounces.

*Ten a. m.:* One to two tablespoonfuls of oatmeal, hominy, farina, arrowroot or barley. The oatmeal or hominy should be cooked three hours and strained. This may be given with thin cream and salt. The child may also have a glass of milk.

*Two p. m.:* A cup of beef, mutton or chicken broth, one soft-boiled or poached egg, boiled rice, or one to two tablespoonfuls of scraped rare mutton or beef. For dessert, the soft part of stewed prunes, baked apple or apple sauce.

*Six p. m.:* Eight to ten ounces of milk and one of the cereals.

*Ten p. m.:* Ten to twelve ounces of milk. If the baby sleeps through the night after the six o'clock feeding the ten o'clock meal may be discontinued.

### DIET FROM TWENTIETH TO TWENTY-FOURTH MONTH

*Six-thirty a. m.:* Ten to twelve ounces of certified milk, pasteurized in the warmer months.

*Nine a. m.:* The juice of one orange.

*Ten a. m.:* One of the cereals well cooked but not strained; six to eight ounces of milk. A slice of bread at least two days old.

*Two p. m.:* Either soft egg or one tablespoonful of scraped meat as above; six ounces of broth, or two to four ounces of beef juice, and soft prunes; baked apple or apple sauce. Water, but no milk.

*Six p. m.:* Imperial Granum or strained barley in ten to twelve ounces of milk.

*Ten p. m.:* Ten to twelve ounces of plain milk.

#### DIET FROM SECOND TO THIRD YEAR

*Seven a. m.:* Cereal, bread and butter, or toast or Graham crackers.

*Nine a. m.:* The juice of an orange.

*Ten p. m.:* A glass of warm certified milk or cup of broth. A slice of stale bread, or toast or Graham crackers.

*Two p. m.:* A cup of broth, if not given at ten o'clock meal. Scraped meat—steak, chop, chicken, beef or lamb. Any of the following vegetables: potatoes, baked, mashed or boiled; boiled rice or macaroni with milk; green peas, spinach, or string beans; or stewed celery. For dessert: rice pudding, junket, custard, stewed prunes, baked apple, or apple sauce.

*Six p. m.:* Cereal and milk, milk toast, or bread and milk. Ten to twelve ounces of plain milk.

#### DIET FROM THIRD TO SIXTH YEAR

*Breakfast (seven to eight a. m.):* Cereals, as oatmeal, hominy, cornmeal, cracked wheat, macaroni or rice, well cooked and served with cream and sugar. Eggs in some form, with the exception of fried. Bread spread with little butter, or toast, or Graham crackers. One to two glasses of certified milk. Avoid hot bread, rolls or biscuit, griddle cakes, and tea or coffee.

*Dinner (twelve to one p. m.):* Broth or soup. Meat—preferably steak, chops, rare beef, lamb, or chicken. Fresh fish, boiled, broiled or baked. Vegetables—Potatoes once daily with cream, or beef juice, spinach, asparagus, green peas, string beans, stewed celery, squash, and new beets. For dessert—baked apples, orange, stewed prunes; rice, sago and tapioca pudding, bread pudding without raisins, soft custard, junket, and ice cream occasionally. Also stewed pears and peaches, if soft, and ripe grapes, if seeds are removed.

**Forbid:** ham, sausage, or pork of any kind; also corned beef, game, duck, liver, stews, rich gravies, dressing for roast meat, salt

and smoked fish, and fish balls. Cucumbers, green corn, cabbage, cauliflower, sprouts, baked beans, old beets and carrots, raw celery, onions, fried potatoes, egg plant, and tomatoes; also tea and coffee.

*Supper (six p. m.):* Cereal or bread and crackers, and twelve ounces of milk.

Give plenty of water between meals.

**Forbid:** candy, nuts, cake, pie, tarts, pastry, tea and coffee at all times, and eating of any sort between meals—a most common and harmful habit. Enforce regularity at meals, the taking of plenty of time, and slow eating of food.

To avoid peculiar tastes as regards food, require that simple food be eaten, even if at first distasteful, and allow the food desired only after the child has eaten the distasteful article.



## PART II

### CHAPTER I

#### PERSONAL HYGIENE

Baths: cold, outdoor, tepid, warm, hot, and Turkish. Care of the complexion, hair, and nails. Choice of clothing.

#### BATHS

Baths are useful for various purposes. Cleanliness demands that the ordinary person should bathe at least twice a week. Dead, scaly particles and fatty secretions of the skin, dirt, and sweat—interfering with the proper functions of the skin in eliminating waste matters—are thus removed, and the kidneys are relieved of performing extra work in carrying off waste matters from the blood, which is forced upon them when the pores of the skin are clogged and irritated by dirt.

Clogged pores lead to skin eruptions, as the common pimples or acne of the young. The daily cold bath (temperature 40° to 70° F.) has a powerful stimulating action on the circulation and nervous system, in addition to its cleansing functions. How great this is may be realized when one appreciates that dashing cold water on the chest has often more effect in restoring consciousness—by exciting the action of the heart and muscles of breathing—than any other remedy.

**Cold Baths.**—The cold bath habit is common among the better classes in England and America, and ruddiness, fine complexions, and robustness, are in no small measure due to the custom. A daily cold bath should be taken on rising by every one under middle

age having the facilities and able to secure the afterglow or reaction which should always follow if the bath agrees. If the bathroom is very warm, reaction is much more apt to occur, and failure in securing a good reaction is often due to a cold bathroom in winter. The cold shower, or merely sponging the body with cold water from a basin, may be used as substitutes.

For many persons unable to take a cold bath without feeling chilly afterwards, and for children, the use of hot water to sit or stand in while taking a cold shower or sponging, will often give the best results. Persons unaccustomed to cold baths should begin them in summer and they will thus be able to continue them through the winter with ease. They are valuable for many who think them impossible; namely, those who take cold readily and frequently, and those below par and needing nervous tone. The cold water should be applied to the skin but a minute or two, and brisk rubbing with a coarse towel should follow.

For young children, old persons unaccustomed to cold water, all persons with weak hearts and high blood pressure, and for women who are menstruating or in the later months of pregnancy, cold baths are inadvisable. Also they are harmful to persons fatigued by severe muscular exertion and to those excessively hot, but may be taken by healthy persons warm with moderate exercise.

Cold baths should be taken before breakfast or, at other times, at least three hours after eating.

**Outdoor Bathing.**—The pure air, the exercise, the sunlight, the stimulating effect of the waves and salt (in sea water), and in addition, the pleasure, make this form of cold bath (usually from 60° to 75° F.) particularly health-giving. It is often, however, grossly abused. The effect of remaining in cold water for a considerable time causes an immense loss of body heat and consequent drain upon the vitality. This is shown by the tremendous fall of temperature seen in patients treated by cold baths for fevers and sunstroke, in which the patients remain no longer and with water no colder than in sea baths taken for pleasure.

Sea bathing is indeed notoriously exhausting to those who stay in the water too long, particularly in the case of children who have

the pernicious habit of alternately playing out of the water in wet bathing suits (evaporation from which is constantly cooling them) and again returning into the water, or wading with bare feet in cold water while their bare heads are exposed to the burning sun—a combination most favorable for sunstroke.

Fat persons can stay in cold water for some time without ill effect; in fact, long distance swimmers have to be covered with considerable adipose tissue to withstand the cold. The length of stay in the water depends wholly upon its temperature—anywhere from two to twenty minutes. The former is too long in many parts of the northern New England and Pacific coasts, whereas the latter is only too short in many of the shallow waters of Cape Cod and middle and southern Atlantic coast of the United States where the water is often 72° to 75° F. or higher.

The stay should never be so long as to cause blueness of the lips and fingers, chattering teeth, or chilliness later. The head should always be wet before plunging into cold water, either by dipping the head or diving. It is unwise to enter cold water when excessively hot, but it is safer to bathe when moderately warm than when beginning to cool after exercise. Those accustomed to cold water may bathe before breakfast to advantage; others should wait until three hours after this meal, or for the same period after other meals.

Immersing the whole body in cold water at first drives the blood from the skin to the internal organs and to the head, if it is not wet, and disturbs the even distribution of the blood about the body. After eating more blood collects in the stomach than usual and agencies still further altering the distribution of blood—as bathing in cold water—may work harm. Nausea, vomiting, cramps in the bowels and sudden deaths have occurred in bathers who have entered cold water soon after eating.

Sudden and unexpected deaths among bathers and swimmers are frequently due to either special weakness of the heart or over-exertion.

The dangers of muscular cramps are probably magnified. There is no more violent exertion than rapid swimming in rough water, and great strain is wrought on even the healthy heart, particularly in

those who are not in training. Then again the nervous shock of a sudden plunge into cold water is sufficient to stop the action of a weak heart and result in temporary unconsciousness and drowning unless help is at hand.

Those who are subject to fainting, palpitation, or known disturbance of the heart, and the elderly not habituated to cold water, should refrain from bathing outdoors, and also those who are likely to suffer from cold baths, as noted above.

**The Tepid or Lukewarm Bath (80° to 90° F.).**—The tepid or lukewarm bath has no special effect on the body apart from the cleansing action. It is suitable for the elderly, convalescents, and those who do not react well to cold baths. It may be taken at any time of day but preferably not directly after meals.

**The Warm Bath (100° F.).**—The warm bath is useful in aiding sleep when taken before bedtime, and also in hardening of the arteries and in Bright's disease of the kidneys, when the patient may remain submerged for five minutes once or twice daily.

**The Hot Bath (105° to 110° F.).**—The hot bath is unsuitable except for the strong, as it is depressing to the circulation, and fainting may ensue. It should only be used at night, or when the bather is to stay in a warm atmosphere, and not after meals. At bedtime the hot bath may, however, cause sleeplessness, unless a cold cloth is kept on the head during the bath. The hot bath is very valuable in preventing colds after exposure and chilling, to relieve pain, as in colic due to the passage of a stone, to stop convulsions in children, and to produce sweating in many disorders, as described in other sections of this book.

**The Turkish Bath.**—This consists of a hot air-bath (120° to 170° F.) for ten to thirty minutes, followed by a hot shower-bath, then shampooing and general massage in warm moist air (100° to 110° F.), and finally by a warm shower-bath changing to cold, with thorough rubbing and drying followed by rest for half an hour in blankets.

Turkish and Russian baths are unsafe for persons having weak hearts or for those who are very stout. They are of value in the first stage of a cold, but the patient must go home in a covered



vehicle and go to bed, for exposure to cold may bring on bronchitis or other respiratory trouble.

Muscular or joint stiffness, following severe physical exertion, and some forms of rheumatism, are much benefited by the Turkish bath.

### THE COMPLEXION

Cold water is better than warm for the complexion and for the skin of all parts of the body. It improves the tone of the skin of the face, gives color, and prevents wrinkles. Chapping of the skin is more apt to follow the use of hot water.

The countless toilet preparations made for application to the face may afford some pleasure to the users, but a few simple remedies will suffice. Rice powder may be applied to the face in warm weather, and cold cream, or equal parts of glycerin and rose water, in cold weather, when the skin is dry and rough. The various face or toilet creams in the market are usually harmless, and are of service in chapping. The face powders are also generally innocuous, but are more expensive than rice powder.

The habitual use of soap on the face is not advisable except in the case of an oily or soiled skin. Thus in acne, or pimples on the face the skin may be scrubbed once daily with the tincture of green soap and the lather left on to dry. This will irritate the skin after a few days, so that it will become swollen and scaly, when cold cream may be applied.

At the same time one should practice massage of the face, with cold cream on the finger tips, so that the skin on the forehead is stroked out from the middle toward the temples and that of the nose stroked downward, while the cheeks are rolled between the fingers and thumbs. This treatment tends to empty out the secretions in the pimples.

There is a vast deal of nonsense in the popular idea that great care must be exercised in the selection of a toilet soap. One toilet soap is about as good as another so far as any beneficial or injurious action of either on the skin is concerned. Soaps are made from

various kinds of fats boiled with an alkali. The cheaper grades of soaps, as the yellow laundry variety, contain an excess of alkali and are therefore more useful in removing grease from clothing but are harmful in causing roughness and drying of the skin for the same reason.

The more expensive soaps have little or no free alkali and one is about as serviceable as another. Plain Castile soap is the simplest of these. Medicated soaps have no great value since the drug in them comes in contact with the skin for so short a time.

## THE HAIR

**Baldness.**—Baldness is caused by a disease, the commonest symptom of which is dandruff. Baldness is favored by wearing close-fitting, ill-ventilated hats, and by deficient blood supply to the hair resulting from a tight-fitting scalp. The best mode of treating baldness is by shampooing and brushing, as described in detail under Baldness and Dandruff (Part I, Chap. IX). Most pomades and hair tonics are of no value. Cutting does not increase the number of hairs, although it makes the hair grow faster.

Barbers are prone to advise singeing to stimulate the growth of hair, but this is of no worth (except to the barber), as it has no effect on promoting the growth of hair. Constant wetting of the hair, practiced by some young persons, is harmful.

**Skin Diseases.**—Several skin diseases caused by parasites are not infrequently conveyed by barbers to their customers by means of razor, scissors, their hands, and especially by moist towels. Among these are ringworm, barber's itch, boils, and even carbuncles. The only way to avoid such accidents with certainty is for the patron to furnish his own razor, scissors, brush, comb, shaving soap, cup and brush, or see to it that the barber cleans his own scissors or razor with alcohol (two parts) and water (one part), and uses a clean, dry towel.

## FINGER AND TOE NAILS

The finger nails should be trimmed so as to follow in outline the contour of the finger tips; the toe nails should be cut in a straight line directly across to avoid pressure by the toes of the boots.

## CLOTHING

**Underclothing.**—In regard to underclothes there are two factors of importance. First, the property of retaining the body heat. Of the three fabrics most frequently used for clothing, wool is the greatest non-conductor, and therefore retains heat most effectually. Impervious materials, as rubber, leather, and mackintosh, retain heat but are unsuitable (because affording poor ventilation), except for outer clothes, as protection from the wind and wet, when one is not taking sufficient exercise to cause much perspiration.

Second, the power of absorbing moisture. Wool possesses the power of rapid and free absorption, but gives out the moisture slowly. Cotton, on the other hand, does not absorb moisture so readily and cools the body much more when wet. Linen is about on a par with cotton as regards absorption of moisture and retention of body heat. Wool is thus the best material for underclothing, but is so irritating to the skin that some persons can not tolerate it. To overcome this merino, or mixtures of cotton and wool, may be worn. In some clothing there is a layer of wool and cotton, the latter next the skin.

As the property of retaining body heat, residing in wool and fur, is largely due to air spaces in these materials, it is found that cotton fabrics woven loosely will, to a considerable degree, take the place of wool. Wool shrinks and becomes matted like felt by continuous washing. Washing in tepid water with frequent rinsing, but without much wringing or rubbing, will in a large measure prevent this felting of woollen goods.

Woollen underclothes are desirable the year round for those who perspire freely, and in certain diseases, as so-called chronic rheumatism and Bright's disease. Linen garments are much more expensive than cotton but will endure more washing. The linen mesh makes



an excellent fabric for hot weather and the tropics, as it imparts a sense of coolness not felt in cotton. Undergarments of bright hues and colored stockings are most undesirable, since the anilin colors used often irritate the skin and produce eruptions.

Stockings should be changed frequently, especially if the feet perspire freely. If this occurs, the feet should be soaked in hot water, dried, and dusted with a mixture of salicylic acid (1 part) and starch (3 parts). The same treatment is useful in excessive perspiration of the hands, and will tend to remove unpleasant odor.

Dampness of the underclothes from perspiration favors the



FIG. 46.—A. PROPER SHAPE OF SOLE OF SHOE. B. FLAT SOLE IN PROFILE OF A SHOE.

growth of disease germs and skin parasites, so that clothes should either be changed when wet, or well aired and dried, when removed.

**Outer Clothing.**—In regard to the outer clothes, black or dark shades absorb heat rays of the sun more than white fabrics, so that white is worn in the tropics and in hot weather.

The amount of clothing worn should depend upon the temperature. While heavy underclothing is needful for those living outdoors in cold weather it is unwise for those spending most of their time indoors in a summer temperature, and many people acquire colds by so doing. The proper way is to dress much as in summer, while in the house in cold weather, but warmly with ulsters, furs, etc., before going into the cold.

**Footgear.**—Hats should not fit but shoes should. A hat made to fit the head is undesirable, in obstructing the circulation and in preventing ventilation. A shoe should be made to conform to the out-



line drawn from the stockinged foot. Shoes should be three-quarters of an inch longer than the foot, the inner line of the toe and heel should practically form a straight line.

The toe should neither be pointed nor absolutely square and the sole should be nearly absolutely flat on the bottom and not turned up at the toe from the ground, like the section of a rocker. The heels should be low. The extension of the soles outward around the uppers affords better support for the foot and pleases some people.

In the cut (Fig. 46) is shown the proper shape of the sole of a shoe and also the flat sole in the profile of a shoe.

## CHAPTER II

### PERSONAL HYGIENE (*Continued*)

Hygiene of the digestion. Care of the teeth. Riggs' disease. Constituents of food—including meats, fish, shellfish, eggs, milk, vegetables, cereals, bread, fruits, salts, and water—and their values as articles of diet. The function of cooking. Tea and coffee. Alcohol. Tobacco.

### HYGIENE OF THE DIGESTION

Digestion should begin in the mouth. The food should be chewed thoroughly, not only because when finely divided it is more readily mixed with the digestive juices of the stomach and bowels, but because it is in this way more fully combined with the saliva which aids the digestion of cooked starchy elements of the food.

It has always been known that hasty eating favors dyspepsia, but it is the x-ray which explains the fact. Rapid eating causes too rapid distention of the stomach with food and swallowed air, and this is what causes pain.

In order that food shall be properly chewed the teeth must be good. Decay or loss of the teeth are commonly regarded as frequent causes of indigestion. It is now recognized that many severe and remote diseases are produced by decay of the teeth and inflammation of the gums and mouth, so that there is a vital reason for keeping the teeth and mouth in good condition. Decay of the teeth is brought about through the agency of germs. A very frequent disease of the gums is the so-called Riggs' disease.

An improper mode of life is probably more often the cause of indigestion than any other disorder. But the great causes of functional dyspepsia are nervous debility and faulty build, described in

detail elsewhere. In patients with nervous weakness any cause which leads the patient to become "run down" will induce indigestion, so that calamities, acute diseases, operations, overfatigue, sexual excesses, or lack of sleep are common factors. Excessive quantities of food or water are bad in dilating the stomach and giving rise to lack of tone so that the contents lie in the stomach for hours undigested and give rise to distress.

The popular fad of cold water drinking may thus induce indigestion. Hasty eating, eating alone, worry, or anything which disturbs the equanimity of mind either during, before, or after meals, unpalatable or improperly cooked food, abuse of alcohol, tea, or coffee, pastry, fried food, candy in excess, lack of exercise, faulty mode of dress in women, overwork or want of occupation, irregularity in the hours of eating—all favor dyspepsia.

Many diseases remote from the stomach give rise to disturbances of digestion—in fact, as we have pointed out elsewhere, ninety per cent. of so-called stomach trouble originates in disease elsewhere. Among these are especially abdominal disorders, as chronic appendicitis, and gall-stones, consumption, Bright's disease, eye strain, anemia, nervous prostration, etc.

Recent research has shown that secretion of the digestive juices in the stomach is started by the desire, sight, and smell of palatable food. It has been found that simply displaying meat to a dog will cause the gastric juices to flow. Then it is known that the later secretion in the stomach and bowels is dependent on the stimulation of that first secreted, so it will be seen what a power desire for food has upon the gastric digestion, and indirectly all the later digestion in the stomach and intestines.

The wonderful progress which has enabled us to actually see all the movements of the stomach by means of the x-ray, when some form of metallic powder has been swallowed which coats the organ (bismuth, barium), has greatly increased our knowledge of digestion. Hunger appears to be due to very strong contractions of the stomach which are lessened by the secretion of gastric juice, food, and warm water. When the food reaches the stomach wave-like contractions, starting every ten to twenty seconds, serve to mix the food and

force it, a little at a time, onward into the bowel, where the most important part of digestion occurs.

The digestion of starch, started by the saliva, continues for a time in the stomach until the acid gastric juice stops the action of the alkaline saliva. The acid food-product of the stomach (chyme) is emitted in jets into the small intestine by an ingenious mechanism whereby the effect of the acid on striking the coat of the intestine causes the outlet of the stomach (pylorus) to close and, as soon as the acid is neutralized by the alkaline juices in the bowel, the outlet relaxes and allows another escape of acid food-product (chyme) from the stomach—and so the outlet of the stomach opens and closes automatically until the organ is emptied.

Very hot and very cold food lessen the activity and digestive power of the juices, and if the food is not well chewed the lumps irritate the stomach and the juices act imperfectly on the surface of the food.

Much the same result occurs in the case of food which is fried or sautéd. Frying or more properly sautéing, for a long time—in a frying pan—causes the food to become hard and tough and to be saturated with grease, so that the gastric juice has somewhat the same effect upon such food as water upon a well-greased boot. The proper method of frying consists in immersing the food in boiling fat in a kettle. The temperature is so high (400° F., or twice that of boiling water) that the fat immediately hardens the surface of the article, and this—together with the steam from the moisture inside the food—tends to keep the fat from entering and saturating it.

Into the bowel—and but a few inches from the outlet of the stomach—enter through a common duct the secretions of the liver and pancreas (bile and pancreatic juice), and these, together with a very important secretion from the walls of the intestines, complete the digestion. Intestinal digestion is much more important than that occurring in the stomach, as is shown by comparative health enjoyed by persons from whom a large part of the organ is removed for cancer. Also, while only cooked starchy food is partially digested by saliva, and only proteids (see below) are partially



digested in the stomach, the intestinal juices are capable of digesting all three nutrients—fats, starches, and proteids.

By digestion is meant a change brought about by mechanical, vital and chemical actions, whereby the food is disintegrated and rendered fluid, and the insoluble part so altered in chemical nature as to become soluble and capable of being absorbed into the vessels from the walls of the intestines. A food is as much outside the body when it is in the stomach or bowels, as it would be on the skin—so far as its having any nutritive value—unless it is so digested as to be absorbed into the blood and assimilated by the cells of the body to build tissue or give rise to heat or muscular work.

Cooking has of course an immense influence on the digestibility of food. For reasons stated above broiling is better than frying, and baking is better than boiling or stewing. Foods impregnated with fat are indigestible, and that is why pastry is unwholesome, although made out of the most wholesome materials.

In baking, broiling, or frying meat or fish a high temperature should at first be applied, to form a firm coating which retains the flavor and juices, while a more moderate heat is then used to continue the cooking. In making soups the opposite course should be pursued, the meat being cut up and allowed to stand in cold or moderately heated water (simmering) for several hours to extract the juices. Stews are made by placing the meat in enough cold water to cover, cooking very slowly till the boiling point is reached, and then allowing cooking to proceed at the simmering point until the meat is tender.

The custom, which is becoming more general, of deferring the most substantial meal to the later hours of the day is based on the theory that there is greater leisure and freedom from mental and physical activity at this time. This state favors digestion, as muscular or mental work draws blood away from the digestive organs to the muscles or brain.

The case of children is different; it is better for them to have the principal meals at breakfast and midday, and a light meal before retiring. It is also very important to prevent children from eating between meals, especially candy, bizarre soda water concoctions,

ices, and sweets. This is a common cause of poor health in boys and girls and the plain diet and avoidance of such indiscretions, required by some boarding schools, has a remarkable effect at times on children from the best (?) homes. Persons doing heavy manual labor usually have large appetites and good digestive powers, and so require and take large amounts of food at each meal with impunity.

The matter of dress in women affects the digestion. The use of corsets constricting the upper abdomen displaces downward the stomach, liver and intestines, and causes kinks to form in the intestines which lead to constipation and indigestion (*See Enteroptosis*). The modern corset goes to the other extreme and embraces the lower abdomen and thighs. Some of the straight front corsets may be of much value in supporting the lower abdomen.

#### CARE OF THE TEETH

This applies not only to the prevention of decay of the teeth, but of irregularities and deformities of the jaw. The narrow upper jaw with the high Gothic roof of the mouth is usually the result of adenoids and tonsils. Because the tendency of civilized life is toward the use of soft prepared foods, the muscles and jaws are undeveloped and are too small for the teeth which take up irregular and crowded positions. This again leads to deformities of the jaws and aids decay by providing crevices for the lodging of food. Loss of the first teeth too early or late also favors deformities of the jaw. There may be protrusion of either the lower or upper jaw. The latter is induced by the sucking of the thumb in infants which throws the front teeth forward.

The presence of supernumerary teeth is another cause of deformities. Deformities appear between the ages of seven and fourteen, when they can frequently be corrected by dentists, as in caring for the first teeth or by straightening the teeth, or orthodontia, which has reached such a state of perfection in the last few years. By this method the whole future shape of the jaw may be greatly improved, and decay prevented by doing away with irregularities which harbor food and germs.

Adenoids and tonsils should be early removed to prevent alteration in the shape of the mouth.

The greatest single aid to cleanliness of the teeth is a perfect polish and the removal of all roughness and irregularities. To this end the teeth should be put in such a condition by the dentist and should be kept so by removal of tartar as it collects, and by monthly visits to him thereafter for preventive treatment and polishing. The teeth should (ideally) be cleaned after each meal, but certainly once daily before retiring at night. Food may lie on the teeth longer at night than at any other time.

The toothbrush should be small and of bristles of varying length so as to reach into the irregular depressions, and not stiff enough to cause the gums to bleed. One should not use the toothbrush as a scrubbing brush, but more as a clothes brush to brush food out of the various crevices on the grinding surfaces and from the spaces between the teeth. A tooth powder or paste should be employed containing some mild antiseptic, as boric acid or oil of wintergreen. It stimulates the flow of saliva—which counteracts acidity and washes the teeth.

#### RIGGS' DISEASE

(*Pyorrhea alveolaris*)

**Symptoms.**—This is an inflammation beginning at the edge of the gums, where they join the neck of the teeth, so that the gums become tender, swollen, and deeper red, and shrink away from the teeth in time while the latter become loosened, and feel tender and elongated. Pus or matter may often be squeezed out about the teeth by pressure on the gums.

There is a bad taste and the breath is unpleasant. It is a universal disease, at some time during every one's lifetime, half of the permanent teeth are lost through this means. The process is usually slow of onset, the pain is slight, and patients who are not careful often wait until the teeth loosen before applying for treatment. The trouble begins in the back teeth, and the first sign may be the bleeding of the gums.



In the less common acute cases there is considerable pain, and the gums and teeth are so tender that the patient cannot eat hard food or use a tooth brush.

**Cause.**—The true cause of Riggs' disease is thought to be due to a microscopic animal organism (*Entameba*), allied to the germs causing malaria and amebic dysentery. Such germs commonly exist in the mouth, but only attack the tissues when these are injured, or the general tone is lowered by disease.

The injury is usually produced by the accumulation of tartar on the neck of the teeth, by irritation of toothpicks, by food jammed between the teeth, or by ill-fitting crowns and bridges and over-hot food. General disease, as gout, diabetes, debility, special infections, and mercury poisoning (salivation) reduce the vitality of the gums and render them more susceptible to inflammation.

The primary and essential cause of Riggs' disease is local irritation. The immediate cause is the growth of germs—possibly the entamebae, and certainly pus germs which attack the gums and produce inflammation of the membrane (peridental) covering the roots of the teeth and also lining their sockets.

This leads to the formation of matter or pus in which these germs flourish, the root of the tooth and the bone of the socket are thus laid bare through destruction of the normal covering membrane. A pocket containing pus, between the root of the tooth and its socket, is the result. This grows deeper and deeper as the months pass, the teeth loosen, and finally drop out.

**Cure.**—There are some fifteen varieties of germs in the mouth, besides those directly causing Riggs' disease. One of the great discoveries of recent years is the fact that such serious diseases as chronic rheumatism, valvular heart disease, chronic Bright's disease, and apparently gall-bladder trouble and chronic appendicitis, originate through the entrance of germs into the blood from inflammation of the gums. Hence the cure of such a condition is of the most vital importance.

The cure of Riggs' disease depends both upon the discovery of its cause and the fact that ipecac is the special poison for the entamebae, as in the case of dysentery.



Bass and Johns find that brushing and rinsing the teeth thoroughly twice daily with a solution containing two drops of fluid-extract of ipecac in a half glass of water kills the special germs superficially exposed. To kill those deep in the tooth sockets the same drug is given by the mouth and acts through the blood. Once a month, until the disease is cured, two Alcresta ipecac tablets should be taken thrice daily for six consecutive days. They are harmless, but may cause some abdominal discomfort and looseness of the bowels. The mouth wash should be used indefinitely, as weeks or months are required for the pockets to heal about the teeth. It is more essential for a dentist to treat the teeth locally by destroying the pus pockets, and to keep the teeth scrupulously clean and free from tartar. It is much easier to prevent than to cure Riggs' disease. Monthly visits to the dentist, to prevent sources of local irritation, will avert the disorder.

## CONSTITUENTS OF FOOD AND THEIR VALUE

The essential elements of food comprise proteids, carbohydrates, fats, salts, and water. Any food or combination of foods containing all of these in right proportion may be regarded as complete; that is, a complete food is one which would alone support an individual indefinitely. Milk comes nearest to such requirements in a single food. Cream contains most of the fat; the casein is the chief constituent of curd (in sour skim milk) and is a proteid, while sugar of milk, dissolved in the water, is a carbohydrate.

Proteids form a large part of the nutritive matter in meat, fish, eggs, and in certain vegetables, as cereals (especially oatmeal), and peas and beans. The value of proteids lies in building up tissue, which is constantly consumed in the vital processes, and in forming new tissue in the growing individual. Proteids also yield heat and energy by their destruction in the body—but this is the rôle played chiefly by the carbohydrates—and they may also form fat in the body.

Proteids are generally the most expensive food, especially in the

very digestible and concentrated form in which they exist in animal products, as meat, fish, eggs, and milk.

The animal foods represent the essence of nutriment which has been extracted from vegetables. Lean meat contains seventy-five per cent. of water, but the rest is practically all protein. Beef contains the most nutritive matter but its fiber is supposed to be a little coarser and less digestible than mutton or lamb. The strong flavor of mutton renders it unpalatable as a constant diet. Both pale and very dark beef are undesirable; the former is not sufficiently hung; the latter has not been properly bled, or is diseased. Beef well streaked with fat is juicier and more palatable although containing much less water (fifty-five per cent.) than lean beef. Veal is as digestible although slightly less nutritious than beef, lamb, or mutton. If pale and soft it is too young (under a month), if only pale the animal was probably bled to death.

A marked distinction between light and dark meats has been made by physicians in the past. Light meats (as chicken) have been allowed in gout, rheumatism, etc., while dark meats have been forbidden. As a matter of fact the chemical composition of both is so nearly alike as to be identical.

There are certain bodies called purins which give rise to uric acid in the body. Uric acid is not readily eliminated in gout, and its retention poisons the patient and gives rise to the symptoms of the disease. The purin bodies are derived from the nucleus of animal cells chiefly, and such animal foods as sweetbread, liver, kidney, brain, fish roe, caviar, meat extracts and bouillons, are particularly rich in them. All the meats contain a considerable amount of purin bodies, but beefsteak almost twice as much as other parts of the animal. There is not much difference in the amount of purin bodies contained in light and dark meat, however.

But vegetables are not by any means free from purins; they are found in the nuclei of all seeds. Dried peas and beans are especially rich in purins and are nearly on a par with meat in this respect and in the amount of protein they contain. Yet, as a whole, vegetables are comparatively poor in protein and purins, and fresh vegetables contain a relatively small amount of either since they

are composed chiefly of water. Milk, cream, eggs, cheese, fresh vegetables, and fruit, are practically free from purin bodies and form the suitable diet for those with gout, and hardening of the arteries.

There are also certain so-called extractive matters in meat, such as exist in meat extracts, beef tea, and clear soup. They are useful as stimulants in sickness when much nourishment is impossible; they stimulate the appetite but possess slight food value. Fish is wanting in these stimulating bodies, but in the matter of composition differs little from meat in the amount of protein and purins it contains. In lacking these stimulating extractives it may have some advantage over meat in certain disorders, as hardening of the arteries. There is a distinct difference, however, between the digestibility of light and dark meat of fish, the dark meat being much less digestible (as salmon, mackerel) in certain conditions owing to the greater amount of fat it contains. The eating of fish for its tonic effects on the nervous system, owing to the appreciable quantity of phosphorus it contains, is an exploded idea.

Shellfish, as crabs and lobsters, are occasionally poisonous to some people, causing digestive disturbances and nettlerash or other eruptions. They should be eaten within twenty-four hours from the time they are killed by cooking. Clams and oysters should also be eaten as soon as killed. The latter have frequently been a cause of typhoid fever when growing in water polluted by sewage contaminated with these germs.

Pork contains much nutriment, especially in the form of fat, but is difficult of digestion, and is more suitable for those living outdoors. Unless thoroughly cooked it may communicate parasites—trichinae and tapeworm—to man.

In regard to the relative food value of meat it may be said that it is the most concentrated form of digestible diet (including eggs), and is stimulating to the nervous system. It is possible to live on fat meat and water alone, as the meat contains a small amount of carbohydrate (muscle sugar). One of the most finely developed tribes in Eastern Africa, the Masai, live almost wholly on blood and milk, rarely taking solid food.



The amount of meat advisable for daily consumption depends upon age, occupation, and climate. Young and growing individuals, those doing strenuous mental and physical work, and those doing outdoor work—especially in cold weather—need an abundant supply of meat, fish, or eggs. For most persons leading a quiet, sedentary existence such a diet is not necessary, and may be harmful.

As meat is the most expensive article of diet and the most palatable it is apt to be eaten in excess by the well-to-do. In this event the products formed in the body are not sufficiently consumed and the waste accumulating in the system occasions such diseases as gout, stone, arteriosclerosis, and possibly various nervous disturbances. In some disorders, as Bright's disease, meat may be positively fatal.

Notwithstanding the present medical consensus of opinion that an excessive meat diet favors arteriosclerosis there are vegetarian monks and natives of Oriental and tropical countries who develop the most marked types of this disease on a wholly vegetarian regimen.

In eggs we also have a concentrated food. The white of the egg is practically pure protein, with water and salts. When firmly coagulated in hard-boiled eggs it is not nearly so digestible as when raw, coddled, or soft boiled. In the yolk of the egg there is much fat (thirty per cent.) and some protein. For this reason if eggs are eaten too constantly their fat may produce so-called biliousness in persons who have weak digestion.

The amount of fat in the yolk of eggs may therefore create a distaste for eggs altogether, so that in giving eggs to the sick in milk it is well to only use the raw whites, which are also commonly given dissolved in cold water.

Milk is more particularly useful in supplying protein and fat. Its composition and method of feeding it to babies is described elsewhere. For the sick as well as for infants milk should be pasteurized, since bacterial contamination is most apt to hurt those in a delicate state of health and, especially, when milk constitutes their chief diet. Milk becomes curdled or partially solid through the action of the acid in the stomach, so that it should be regarded as



a solid food. When digestion is very feeble fluids, like broths and white of egg and water, or beef juice, are more appropriate.

Milk to which is added salt, or one-third lime water, or rich milk diluted with an equal amount of carbonated water is more digestible. A preparation called liquenzyme aids in the digestion of milk, and one teaspoonful may be added to a glass in case milk does not agree. It is well not to take milk cold from the ice but slightly warmed, unless mixed with soda water.

Milk is the most valuable food for the sick, but it takes at least two quarts of milk to support a person in bed. The food value of one glass of milk is equal to that of two large eggs, two potatoes, two slices of bread and a large serving of lean meat (Rosenau). If half milk and half cream are taken much less is necessary. Milk is more readily digested if taken with crackers or toast, or some starchy food, and is more appropriate at the lighter meals, or between meals, or at bedtime, than at dinner.

The author is accustomed to recommend to the thin and debilitated one pint each of milk and rich cream (mixed) daily, one glass at breakfast, one in the middle of the morning, one at lunch, and one at bedtime. It is not unusual to see a gain of twenty pounds in three months on this diet.

Vegetables also contain the same chemical constituents as meat. To obtain the same amount of protein, as in meat, a much greater bulk would have to be eaten, and vegetables are not so digestible as meat. Peas and beans in the dried state contain about as much proteid as meat (twenty-five per cent.), however, and nearly fifty per cent. of starch, and are therefore extremely nutritious when they are well digested. This accounts for the popularity of baked beans which, with the fat derived from pork, form a very complete food for outdoor workers. Pea and bean soups are both digestible, cheap, and exceedingly nutritious.

All cereals contain considerable proteid matter—ten to twenty per cent.—of which wheat is the most valuable, but as carbohydrates (or starches and sugars) are the chief nutrients we will consider them under this head. Rice contains little but starch. The carbohydrates then predominate in vegetables, although protein and a not incon-

siderable amount of fat may also be present. The product of the digested starches and sugars is sugar which is burned in the liver and muscles to form heat and energy in the body.

The carbohydrates furnish the fuel for the bodily machine, while the proteids build the machine and keep it in repair by supplying new substance to the tissues as they waste in the wear and tear of life.

Carbohydrates may also form fat and, in being more readily consumed in the body, protect the more valuable proteids from consumption.

There is not enough protein in vegetables to form a complete food without the addition of abundant fat. Thus bread and butter make a pretty complete food, but the amount of protein is too small and the bulk too great to form a suitable diet. Fat is consumed in the body with the liberation of heat and energy, but an equal weight is approximately twice as valuable as starch in this respect. Fat is then much more valuable than carbohydrates in supplying heat to the body so necessary in cold climates. Fat is an essential part of the body and acts as a storehouse of energy which may be called upon when sufficient nourishment is not obtainable, as in some illnesses. It lubricates the tissues and prevents constipation by the same action on the bowel contents.

The fat in the body is formed chiefly from carbohydrates and proteids in the food, the fat in the food being burned up for the immediate necessities of heat and muscular movements. Fat in abundance is particularly needful in weakness of the nervous system, as nervous prostration, in all wasting diseases, and in those predisposed to consumption.

Fat is not so readily digested as many forms of proteids and carbohydrates. Those fats which are fluid at the temperature of the body are generally most digestible. Butter, cream and bacon are most digestible among the animal fats and are those which are to be recommended. Some vegetables contain large amounts of fat, as nuts. Peanuts, for example, contain forty-one per cent. of fat and twenty-eight per cent. of protein.

There is about five per cent. of fat, or a little more, in Indian

corn and oatmeal. Nuts are somewhat indigestible but very nutritious; the peanut paste is more digestible than the whole nuts.

A pure vegetable diet is too bulky for human beings, and when an ordinary mixed diet is not advisable a vegetable diet, including bread and cereals, may be combined with an abundance of fat in the form of butter and cream. Green vegetables and roots consist chiefly of water, seventy-five to ninety-five per cent. They are valuable for their palatability and because their succulence, cathartic constituents, and indigestible residue, aid the action of the bowels.

Certain properties are attributed to special vegetables. All green vegetables, especially spinach, are thought to be more valuable as a source of iron than other food. Onions contain sulphur; celery and lettuce contain principles having a sedative effect on the nervous system; new beets are digestible and contain considerable sugar; cabbage and all the green vegetables (including potatoes) are rich in salts which are valuable in the body in assisting various processes.

It is better to roast, steam, or cook vegetables in some other way than by boiling (which removes the salts), unless the water in which they are boiled is used for soups or stews.

Cereals are the most concentrated of the vegetable foods. They contain from ten to fifteen per cent. of water, from ten to twenty per cent. of proteids, from sixty to seventy per cent. of carbohydrates, and from five-tenths to six per cent. of fat, besides phosphates and other salts of value to the body. Wheat, which may be regarded as most nutritious, contains thirteen per cent. of protein, sixty-six per cent. of carbohydrates and one and six-tenths per cent. of fat. There is fifty-five per cent. of starch in bread.

The carbohydrates consist chiefly of starch that is enclosed in nature in cells which are ruptured by crushing, boiling, etc., so as to make the starch digestible. Raw starch, as in raw potatoes and bananas, is not digestible because the starch granules are unbroken and not so readily acted upon by the digestive juices. The cereals are now used largely for breakfast foods. Many of them are cooked and roasted to make the starch more digestible by converting it into dextrin. These foods are chiefly to be objected to on the score of too great bulk for the amount of nutriment which



they contain, particularly the puffed and shredded varieties. The older cereals, as hominy, oatmeal, cracked wheat, Indian meal, graham meal, etc., if cooked for several hours, are to be advised for children in preference to the modern aërated cereal foods which appease the appetite without supplying sufficient nourishment.

The whole wheat and rye flours are more valuable for making coarse bread which is suitable in constipation.

Fruits consist almost wholly of water, apples containing eighty-four per cent. of water, two-tenths per cent. of protein, and fifteen per cent. of carbohydrates. Their acids, sugars, salts, and water aid the action of the bowels but they have little nourishment and should not be eaten between meals lest they spoil the appetite.

Raw fruit is often harmful because unripe, and more often, in the case of quickly perishable fruits, as berries, contain germs and cause fermentation. Disease germs in manure (strawberries) and dust may also contaminate raw fruit. When the outer peel of fruit is not removed, cooking is desirable. Young children should only receive cooked fruit (except the juice of oranges), and for older children, apart from oranges and cherries, it were better that the fruit were not raw. Strawberries are a very common cause of digestive troubles, and even of appendicitis, probably from their contamination with germs in lying on the ground; most persons can take the cooked berries. Bananas are indigestible for young children (unless baked) and the author has seen severe indigestion and even convulsions in infants from their action.

In comparing the nutritive value of a meat and vegetable diet it may be said that vegetables must be eaten in much larger amounts to obtain the same nourishment, and that dried peas and beans, most nearly resembling meat in composition (beans, 25 per cent. proteids, 40 per cent. carbohydrates, 1 per cent. fat), are more indigestible.

The inorganic salts which are essential to the structure of bone and tissues exist to a sufficient extent in ordinary food, with the exception of common salt, which is necessary to form the digestive juice in the stomach, as well as being an important constituent of the fluids of the tissues. Salted foods, as salt pork, corned beef,



saltfish, etc., are indigestible because water is abstracted by salt from the food which is thereby rendered drier, denser, and harder.

Water should be taken daily to the extent of at least six glasses, either pure or in the form of other drinks. It is better that half this amount be taken between meals so that the digestive juices be not unduly diluted, and that the food be properly chewed and mixed with saliva, and not simply washed down.

Water is essential in dissolving food elements, in aiding escape of food from the stomach into the bowels and in assisting the movement of the undigested and indigestible matter in the intestines, and so preventing constipation. Drinking an abundance of water also assists in the elimination of waste matters from the blood in the kidneys, and prevents the urine from becoming so concentrated that irritation of the urinary tract and formation of gravel or stone might occur.

An abundance of water stimulates the appetite and the formation of fat—especially if taken at meals. Water should not be taken at meals at all, except in coffee, tea, milk, soup, etc., by persons trying to reduce weight. The drinking of great quantities of water, as several quarts daily, is inadvisable in causing dilation and inaction of the stomach (atony), especially in the case of cold water.

The drinking of large quantities of hot water is also unwise, and ice water at meals tends to delay digestion. Some proteids and some fats are much more valuable than others, and fresh meat, eggs, milk, vegetables and fruits contain substances absolutely essential to growth and life (vitamines) absent in starches, sugars and fats (*See* pp. 589-91).

In regard to ice taken in iced drinks or food, there are two sources of danger. One, when ice is made from polluted water in which human excrement and urine may furnish the germs of typhoid fever and diarrheal diseases; the other, that these same germs may contaminate ice through its handling by persons with dirty fingers, which not infrequently are soiled by their own excreta and these may contain the germs just noted. One would certainly not drink water in which such persons as servants and railway employees had dipped their hands, and yet one is apt to do this

every day of one's life unwittingly, in the form of melted ice.

One may then avoid the dangers of ice, first, by using only absolutely clear ice, since ice from polluted water is apt to be dirty or cloudy—unless the germs and dirt have settled out of it; second, one may escape the dangers from contamination of pure ice after it is formed, by having it washed with pure water and not handled by those with dirty fingers. As the latter requirement is impossible of attainment in public service, ice water supplied for the public in hotels, cars, stations, and the like, should be made by such means that the ice does not come in direct contact with the water.

#### TEA AND COFFEE

It is a remarkable fact that the same chemical substance—cafein—is to be found in all the national beverages of the world. It is the active principle in tea, coffee, and cocoa, in kola seeds used by the Africans, in guarana, drunk in the Amazon valley of South America, in maté tea, made from the leaves and shoots of a species of holly in Paraguay and Uruguay, while in Mexico and the West Indies the fermented chocolate beans are used which contain a principle (theobromin) closely allied to cafein. Unconsciously natives of various countries felt the necessity of a certain stimulating principle and discovered it independently in various plants.

Both tea and coffee contain, besides cafein, a volatile oil, generated in roasting coffee and occurring naturally in tea. Boiling water should be poured on both, but neither should be boiled, or the volatile oil or aroma will escape. If coffee is boiled long the water extracts matters from the bean which interfere with the digestion. If tea is steeped for some time the water dissolves tannic acid from the leaves which quite seriously disturbs digestion, has a tanning effect on the stomach, and lessens the amount of gastric juice. It is probable that the volatile oil in coffee is responsible for biliousness in some persons and it has a marked laxative effect in others, while tea—owing to its tannic acid—is constipating.

Tea and coffee are direct stimulants to the brain, heart, and muscles. Experimentally it has been found that both increase the

capacity for mental and physical work. Stenographers can write better and longer and soldiers march further under caffein than without it. Tea or coffee are bad for persons with nervous indigestion. Both do much harm when taken in excess and in those who are poorly nourished, anemic, lead sedentary lives, and possess weak nervous systems, the effects are marked. Indigestion, insomnia, palpitation, and rapid, irregular pulse, constipation (tea), headaches, neuralgia, and general nervousness, are among the more common symptoms. If any such symptoms arise it is always wise to at once refrain from taking tea or coffee, since only in this way is it possible to surely attribute the symptoms to the beverage. There are unquestionably many wretched nervous persons who are merely victims of caffein poisoning from tea or coffee. For an unusual mental test, a previous cup or two of coffee may bring out the best results, as in an examination, but an excess will cause nervousness and impede clear thinking.

Chocolate is made from seeds of the chocolate plant, after they have been deprived of their shells (cocoa shells), sweated and dried (removes the tannin), and roasted; the latter brings out the flavor. Chocolate contains thirty to fifty per cent. of fat (cocoa butter), which retards secretion and motions of the stomach—like other fats—and it cannot be taken in large quantities for this reason.

Cocoa is made by pressing some of the fat from chocolate, and contains from fifteen to thirty per cent. of fat. Poor cocoas are made by diluting cocoa with starch, and in Dutch cocoas the fat is partially saponified by the addition of an alkali. Chocolate and cocoa should be boiled about five minutes to dissolve the starch naturally present in the bean. Cocoa is more digestible than chocolate and is highly nutritious when made with milk. There is a Phillips's digestible cocoa in which the fat is predigested and it is particularly suited for those with weak digestion.

Tea contains one to four per cent. of caffein, coffee from six-tenths to two per cent., and chocolate about the same amount of theobromin and one-third to one per cent. of caffein besides.



### ALCOHOL

While there are many differences of opinion in respect to alcohol, yet there are certain facts accepted by scientists which it may be well to state.

That alcohol is of benefit to the healthy person living under normal conditions it is impossible for any one to prove. But, on the other hand, it can be positively demonstrated that the habitual use of a moderate amount of alcohol, or the occasional use of an excessive amount, are capable of greatly damaging the health.

It is, furthermore, an incontrovertible fact that alcohol may be of the greatest service in disease and, under certain conditions, in preventing disease. Again, while the occasional use of alcohol in moderation may not cause any visible injury in the average healthy individual, yet in some otherwise healthy persons its influence is so great that it becomes impossible for them to use it in moderation. Moreover, some individuals can habitually consume considerable quantities of alcohol without suffering any apparent detriment therefrom (although their children may), while other persons, apparently as strong and living under the same conditions, will be completely wrecked by the same amount.

Alcohol has been called by some a food, by others a poison. It is not ordinarily a food in health because the harm that it does completely overshadows its value in supplying heat and energy; for example, its harm in being irritant in concentration in the stomach, in being destructive to tissues in the body in large amounts (especially the liver), in its stupefying action on the brain, and finally in its tendency to encourage users to excess.

Alcohol is a very expensive food and must be paid for in blood and coin. Alcohol is particularly harmful for frequent use by women and children but is often of positive benefit for the aged. Like tea and coffee, alcohol is much more injurious to the underfed than to the well-nourished individual.

Alcohol has been called a stimulant. Its action on the brain is quite the contrary, and it is a narcotic or agent essentially depressing the brain. Like ether or chloroform, there may be a slight



preliminary exciting effect, but its chief action is progressive stupefaction.

Its first effect is to remove the highest mental quality, restraint (*in vino veritas*), so that for nervous public speakers a small amount of alcohol may overcome the restraint and nervousness which interferes with free thought and speech, and the imagination in writers and the emotion in musicians may be stimulated; but the habit is bad and the amount desirable is uncertain. The removal of the restraint exercised by the brain over the sexual desires is marked, and the first errors of youth are usually committed under the influence of alcohol. Failure in judgment, inability to appreciate consequences, carelessness for feelings of others, and recklessness, follow the first effects of alcohol. Mental acts requiring accuracy are performed less well.

Experimentally it has been found that typesetters make more errors, musicians strike more false notes, and that sight, smell, hearing, and touch are less keen under the influence of moderate amounts of alcohol, and memory and mental powers are much impaired.

Coffee is the direct opposite of alcohol in its action on the brain, being a true stimulant, and actually improving the normal mental functions. After-dinner coffee tends to counteract the effects of alcohol at dinner.

As a stimulant to the circulation alcohol has always been par excellence *the* stimulant. It has so little effect in increasing the force of the heart that experimenters find no increase of blood pressure from its use; that it has any stimulating effect on the circulation, has been denied by reliable authorities. The consensus of scientific opinion, based on a vast number of experiments, is that alcohol in concentration (one part of whisky with two of water) stimulates the heart briefly from its irritant action on the mouth and throat (reflex action as from inhaling ammonia), and it has beside a very slight stimulating action on the heart itself; so that doctors do not rely upon alcohol in emergencies as a stimulant but have much more powerfully acting remedies.

In the case of accidents it is the agent most often at hand, and the sedative effect on the brain is often of great value. Alcohol

causes at first greatly increased muscular power for a very short period, but after this time there is a marked loss of strength—sometimes to the extent of fifty per cent. Alcohol is then a bad preparation for any work which requires judgment, memory and the utmost capacity of the special senses.

As we have seen it is equally bad for sustained muscular work. It should only be used *after* severe muscular exertion and other unusual demands on the nervous system—never as a preparation for them. Alcohol greatly lowers the body temperature, especially when exposed to cold. It is related of certain explorers who were spending the night on a cold mountain top, after a hard day's climb, that some took no stimulant and turned in cold and miserable; that others took whisky in moderation and retired feeling warmer and more comfortable; that the rest indulged freely in drink and slept oblivious of all cold and discomfort whatever. In the morning those who had refused alcohol awoke refreshed and well; those who had taken a little alcohol awoke very cold and wretched; while those who had freely indulged did not awake at all, because they were dead.

The bad effects of alcohol in health are often absent in sickness. The action of alcohol in increasing the pulse in health may be reversed in fevers where it may slow the pulse and reduce fever. But its use as a routine in medicine has largely disappeared, and there is a general tendency toward reduction in the social use of strong alcoholic drinks.

Savages quickly succumb to the action of alcohol, and in the evolution of the race, the fittest survive. Thus families and individuals addicted to alcohol tend to perish, and the disease becomes less prevalent.

The effect of alcoholic beverages depends chiefly upon the amount of alcohol contained in them. Whisky, brandy, and rum contain approximately about fifty per cent. of alcohol; gin contains about sixty to seventy per cent.; California hoch, Riesling, sherry, muscatel, Madeira, claret, and the Rhine and Hungarian wines contain twelve to fourteen per cent. of alcohol; imported sherry sixteen to twenty-five per cent.; champagne ten to thirteen per cent.; ale,

stout, beer and porter three to seven per cent.; and hard cider five to nine per cent.

The stronger liquors should be diluted with only once or twice their bulk of water in emergencies. The bouquet or flavor of alcoholic beverages depends upon the development of certain alcohols (esters) in course of time. Whisky should not be used until four years old, as in this time the harmful fusel oil and wood alcohol will be converted into the desired bouquet-giving esters.

A sweet wine contains free sugar, while a dry wine is free from sugar because all of its sugar has been changed by fermentation into alcohol. A red wine is made by fermenting the juice of red grapes in the presence of their skins and contains some tannic acid which makes it somewhat rough. White wine is prepared from grapes free from skins, seeds, and stems. Scotch and Irish whiskies have a smoky taste from being distilled over peat fires, or being made from malt dried over peat fires. Gin is redistilled with juniper berries which makes it more useful in relieving pain, and gin is employed for this purpose by women during menstruation.

A tremendous wave of prohibition is sweeping over this country at the present time (1915), and indeed over the entire civilized world. The actuary of the New York Life Insurance Company has recently made a statistical study of the deaths of two million policy holders (picked risks) during twenty-five years. He states that "total abstainers have a mortality during the working years of life of about one-half that among those who use alcohol to the extent of at least two glasses of whisky a day." In other words, there are twice as many deaths among the drinkers (to the extent noted) as among the abstainers, during the period mentioned.

#### TOBACCO

The enormous use of tobacco renders its consideration of importance. The annual world output is something like two billion pounds. Unfortunately one cannot so glibly express in figures the results of its consumption. Let us first briefly consider its action on the body.

Tobacco is a narcotic and is classed in books on drugs along with



alcohol, opium, ether, etc. Narcotics are drugs which essentially produce stupor. In their milder action they are sedative and soothing, while general unconsciousness and paralysis follow their most pronounced influence.

But there is often a preliminary stage of stimulation, seen more markedly in the action of alcohol and ether. In the case of tobacco there is a primary, inappreciable stimulation of the nervous and circulatory systems, but the only immediate noticeable effect in the use of tobacco is the secondary, sedative or soothing action.

After *action* comes *reaction*. This is seen following excessive smoking, especially when one stops using tobacco. The nervous system has become unstable and irritable, as shown by restlessness, walking about, and general "nervousness." There is still a much more remote influence of the long-continued use of tobacco and this may not be appreciated for years, or until middle life, when a general loss of vigor or some of the special results of tobacco become evident. It is very difficult to convince people of this secret, slow, undermining effect; it must be taken on trust. As in the case of disease, prevention is to be preferred to cure, and it is the boy and young man who must be prevented from beginning the tobacco habit. The present difficulty is that, as a rule, the persons who should have most influence in this good work—the parent or teacher—are handicapped at the start in being themselves tobacco users.

Youth is a heedless animal, who recks little of the future, and it will be necessary to present the case impressively and truthfully to influence in any way his conduct. I shall not moralize, but will only furnish facts.

Tobacco affects the circulation as it does the nervous system, that is, it first stimulates and then depresses the heart, and first contracts and secondarily dilates the blood vessels. In both increasing the action of the heart and contracting blood vessels tobacco greatly increases blood pressure, temporarily, and it is generally considered one of the causes of hardening of the arteries which occurs in middle or later life. The depressing effect of tobacco on the heart may lead to disturbance of its action.

There are certain well-recognized troubles which physicians know



may be produced by the excessive use of tobacco. These are as follows:

1. Disturbance of the heart, pain about the region of the heart, a fluttering feeling or palpitation of the heart, shortness of breath, and rapid, irregular pulse, are frequent results of tobacco. More rarely the pulse may be slow and blood pressure low from the action of an excessive use of tobacco.

2. Irritability, mental depression, and lack of energy and ambition commonly follow the overuse of tobacco owing to its baleful influence on the nervous system. Headaches, dizziness, and trembling of the hands are frequently present from the same cause.

3. Tobacco has a locally irritating effect upon the mouth and throat. Dry, hot smoke is more irritating, so that smoke from cigarettes is most injurious in this respect. Soreness of the throat is common and the irritation is apt to extend up along the eustachian tubes, which lead from the upper part of the throat to the ears, and in this way deafness (catarrh of the middle ear) is not infrequently produced by excessive smoking. Cigarette smokers have often a peculiar, harsh, loud, ringing or barking, dry cough, and some harshness or hoarseness of the voice, from the effects of smoke upon the vocal cords. In the mouth excessive smoking sometimes produces white patches on the tongue or inside the cheeks (leukoplakia) and one of these, after years, quite frequently ulcerates and results in cancer. Cancer of the lip is seen almost wholly in men, and is to be attributed often to the constant pressure of a pipe stem on this part.

4. Indigestion of various kinds is occasioned by abuse of tobacco. That form associated with an increase of acid, which causes so-called heartburn, is common.

5. The paralyzing effect of tobacco on special nerves (optic nerve) is seen in partial blindness or dimness of sight due to excessive smoking; vision is usually better in a poor light. Deafness may also be caused by the direct action of tobacco on the auditory nerve, as well as by its effect in producing catarrh of the middle ear, which has been noted.

All of these troubles are not frequent occurrences in individual

smokers, or the habit would suffer in popularity, but in the aggregate there are a tremendous number of such cases and one may never know whom it will affect. In a general way, nervous individuals and those working indoors withstand tobacco poorly as compared to the phlegmatic individual and the outdoor worker. These morbid conditions are usually quickly removed by complete abstinence from tobacco and by adopting a healthy manner of living with outdoor exercise. In fact, in the presence of one of these troubles, it will be impossible for the physician to certainly know that tobacco is the cause unless the habit is stopped for some weeks.

There are still other serious moral and physical results from the use of tobacco by the young. By careful study of the students at Yale and Amherst colleges it has been found that the growth of smoking students is decidedly checked by excessive use of tobacco and that the height, weight, and chest measures of smokers are below normal. At Columbia College, Meylan found that the use of tobacco leads to idleness, lack of application, ambition, and scholarship. The celebrated lay specialist in drug habits, Charles B. Towns, states that in his opinion tobacco diminishes the efficiency of the smoker about fifteen per cent., and he regards the use of tobacco as more serious than addiction to alcohol, opium, or cocain because "the total harm done by tobacco is greater (i. e., in the aggregate) than that done by alcohol or drugs. Nothing else at the present time is contributing so surely to the degeneration of mankind as tobacco."

Towns finds that he cannot cure alcoholism, except in persons of the strongest character, when they continue the use of tobacco. He finds that almost all alcohol and drug habitués smoke also, and that excessive smoking is almost sure to lead to drinking. The nervous depression produced by smoking causes a natural desire for alcohol, just as the depression caused by opium is relieved by alcohol.

Besides the chief poison in tobacco, nicotin, there are allied substances, as pyridin, collidin, etc. Nicotin ranks with prussic acid and aconitin as the most powerful poisons known. One-twentieth part of a drop is a dangerous dose, and there is enough nicotin in a cigar to kill two men—not habituated to tobacco—providing

it could be all absorbed into the blood. Nicotin is a colorless, volatile, oily, acrid liquid. In Virginia tobacco there is two to six per cent. of nicotin; in Turkish tobacco from two to five per cent.; in Havana tobacco from one to three per cent. In tobacco smoke, besides nicotin, there is another toxic substance, furfural. This is an ingredient of fusel oil, the body in new whisky, which gives rise to headache and other troubles. There may be indeed as much furfural in one cigarette as is contained in a wine-glass of whisky. It is often absent in Turkish tobacco. The taste, and flavor, and to some extent the strength, of tobacco is due to a volatile oil developed in curing.

Much of the nicotin is destroyed in smoking or burning tobacco—from one-fifth to four-fifths, in fact. Nicotin being volatile, that which is not burned is largely inhaled with the smoke. The drier the tobacco the more rapidly it burns and the greater the destruction of nicotin. In this respect cigarettes are least harmful. The mildest cigars are thin and dry. In smoking thick, moist cigars there is a hot, damp, steaming area behind the flame which is most favorable for the volatilization of nicotin.

Lee performed an interesting experiment which shows how much more nicotin is destroyed in smoking cigarettes than in smoking cigars. The same amount of tobacco was burned in a cigar and cigarette, but the cigarette tobacco contained double the amount of nicotin. Nevertheless, the smoke of the cigarette contained but half the quantity of nicotin found in the smoke of the cigar.

Notwithstanding all this, ordinary cigarette smoking is the most injurious. Pipe smoke is stronger than either that from the cigar or cigarette. This follows because in the bottom of the pipe bowl there accumulates a sharp, pungent, moist admixture of saliva and tobacco. This is not nicotin, as commonly supposed, but is rich in the poison. In smoking the heat distills off nicotin from this moist sediment and it is inhaled in the smoke. There is about as much tobacco in five or six cigarettes as in one average cigar. A moderate smoker may be considered one who smokes a single cigar daily after dinner.

The cigarette is most harmful for several reasons. Foremost,



cigarette smoke is usually inhaled. This brings the smoke in contact with an enormous lung surface for absorption. The lungs are made to absorb gas (air), and the effect of drugs inhaled is much more rapid than when swallowed; hence the instant action of laughing gas, and the reason why opium is smoked by addicts rather than swallowed. Cigarette smoke is so mild that smokers find little pleasure in merely drawing it into the mouth and throat, as in smoking cigars and pipes, but they must inhale it to secure the full drug effect on the system. If a person were to smoke two or three cigarettes daily, and never inhale the smoke into the lungs, the influence upon the health would be negligible.

Formerly, when only pipe and cigar smoking were available to youth, the liability to dreadful nausea and collapse, and the expense acted to dampen the enthusiasm for initiating this manly habit; now the cheapness and mildness of cigarettes (which sometimes even are drugged to prevent nausea) lead to their use by boys at an early age. The cost is so slight that they are smoked at all available moments when there would not be time to smoke a cigar or pipe. The inhaling and the constant smoking are then the chief dangers of the cigarette. The local, irritating effect of the smoke upon the throat is greater than that from the moister cigar and pipe smoke, as has been said.

Boys are often forced to smoke surreptitiously and this brings them into low companionship and surroundings, as the tobacco stall, pool and barroom, when a vicious circle is established. Towns affirms that average opium smoking does no more harm than average tobacco smoking with inhalation.

Why does one smoke? A smoker would feel hard put to it to give a more precise reply than that he liked the sensation. Smoking is partly a narcotic and partly a psychic habit. Its narcotic influence is exemplified in its soothing, quieting drug action, in relieving anxiety and worry, and in producing a pleasant frame of mind.

Its psychic action depends upon the presence of an object in the mouth (as an infant sucks a blind nipple), upon the rhythmical inhalation and exhalation, and the hypnotic effect of watching the smoke curl into fascinating and fantastic forms and rings. For



the reason that there is not so great a physiological demand of the system for nicotin, or craving, as for alcohol, opium, or cocain in habitués, it is easier to break off the habit abruptly. One then satisfies the psychic demand by chewing gum, quassia, gentian, or by eating candy, and the craving does not grow unless in the case of the inveterate smoker.

In addition to the ease and comfort of mind produced by smoking there are the less desirable mental effects which lead to laziness, lack of energy, and the tendency to avoid responsibilities and duties. In the present day *efficiency* is worshiped as a fetich and its lack is unhappily only too horribly patent in the present great European war. This is the feature which should prevent the youth from beginning the habit.

We have already noted that, in the opinion of an expert in drug habits, tobacco smoking diminishes one's efficiency about one-sixth. Youth realizes that success in business and sport is largely dependent upon personal energy and vigor. The tennis or billiard player is notoriously not up to his best when saturated with tobacco smoke on account of the resulting unsteady nerves.

The matter of tobacco is in like case with other harmful habits, for no sensible person will affirm that tobacco improves the health. It simply becomes a question of how much injury tobacco does. This depends upon the personal constitution, the amount of tobacco absorbed, and the occupation of the individual. Its effects may be imperceptible in the parent but may lead to a defective nervous system in the offspring, as is indisputably true of alcohol. If we are smokers we must confess ourselves fools to our sons in praying them to improve upon their fathers.

## CHAPTER III

### PERSONAL HYGIENE (*Continued*)

General influence of exercise and of excessive exercise. Exercise for different ages.

#### EXERCISE

**Exercise in General.**—Reference is made here to that form which is usually thought and spoken of as muscular exercise. There are involuntary muscles, so called because they are not under control of the will—as the muscles of the heart, digestive tract, blood vessels, and diaphragm.

A muscle is made of numerous small, microscopic fibers bound together in bundles and attached usually to the bones—in the case of voluntary muscles—at either end by a white, strong tissue in the shape of a cord. Muscular action consists of a shortening and thickening without change in bulk. In this way one bone is moved upon the other.

But the muscle is only part of a mechanism necessary to muscular action or exercise. The mechanism concerned in exercise is a neuro-muscular (nerve-muscle) one. In this mechanism there is the nerve center in the brain, the nerve which carries impulses from this to the spinal cord, nerves which transmit impulses to the muscle from the cord, and the muscle itself.

Muscular action may be voluntary, automatic, or reflex. In voluntary action an impulse originates in the brain and travels along the circuit just described at the rate of about two miles a minute until it reaches the muscle and results in contraction. Automatic action is sustained by impulses which are sent from the

central nervous system to the muscles without conscious knowledge or volition, as occurs in the case of the heart beats and movements of the digestive organs.

Reflex action happens when an impulse, started by some irritation of a nerve of sensation, is conveyed by that nerve to the brain or spinal cord, and is there transformed into an impulse which travels along the motor nerve of a muscle and results in contraction of the muscle to which the nerve is connected. Reflex action occurs independently of the will, as when winking follows touching of the eyeball, or when the sole of the foot is tickled and the foot moves. Such action may take place when the subject is asleep or unconscious, or in spite of attempted opposition by the will.

In addition to the nervous impulse there must be a sufficient supply of fuel and force brought into the muscle. This, as we have seen in the consideration of the rôle food products play, consists chiefly in the combustion of sugar in the muscles by oxygen brought to them in the blood. The result is the production of heat and muscular work or contraction. Exactly what a nervous impulse is and just how the oxidation of sugar (in the form of glycogen) results in muscular contraction we do not know. Although sugar is the favorite fuel for muscular action, yet meat and fat may be used as fuel in place of starches and sugar. Sugar is one of the best stimulants to the muscle during unusual exertion.

Muscular fatigue is due to three causes: failure in the food supply of the muscle; accumulation of waste products from chemical changes occurring in the muscle, and failure of the nervous system to transmit impulses.

Nervous insufficiency may be due to the paralyzing effects of the waste products in the muscle acting upon the nerve endings, or to alterations in the brain cells which have been detected microscopically after overuse of the muscles in animals. In any event one should keep in mind that efficiency of the nervous system in muscular exercise is the most essential factor. It is indeed quite generally recognized that nervous activity and force is of great value in even purely physical contests, and conversely, that in nervous exhaustion or prostration, muscular power is sometimes almost abolished.

**Effect of Exercise on the Body as a Whole.**—In muscular exercise there must also be nervous exercise. Just as a muscle grows larger, firmer, and stronger by exercise, so the brain and nerve cells become more efficient in the way of rapidity, acuteness, and precision of movements. Exercise of the muscles develops the brain then to a certain extent.

During muscular work the combustion of fuel in the muscles gives rise to much heat and waste matter. The heart beats are increased in number and force. This follows for several reasons: the waste matters circulating in the blood, the increased blood supply to the heart, and the increased temperature of the blood stimulate the heart. When a muscle contracts, the arteries conveying the blood *from* the heart, widen and shorten and permit a freer circulation of blood.

The veins, which carry the blood *from* the muscles *to* the heart, possess valves which prevent the blood from flowing back away from the heart. During muscular contraction the veins are compressed by the muscles, and this compression has the effect therefore of forcing the blood on toward the heart. Thus the amount of blood which flows through a muscle during exercise has been found to be three times greater than when a muscle is at rest. Thus muscles have been likened to hearts, and the heart in its turn is but a large muscle. The greater quantity of blood which flows through the heart during exercise stimulates it to contract more forcibly, and the action being more rapid—for the reasons stated—and the organ being itself more fully nourished by its increased blood supply, it follows that the heart grows larger and stronger like any other muscle.

The breathing is also stimulated and becomes more rapid and deeper; this is because the waste matter (carbonic dioxid) formed during muscular action stimulates the respiratory centers in the brain. Thus more oxygen is taken into the lungs and carried in the blood to the muscles where it is used in burning the fuel for muscular activity.

Notwithstanding the increased heat formed by the muscles during exercise, the temperature of the body is but slightly raised by



the most violent exertion, because the increased circulation in the skin brings more blood to the surface. This condition allows of greater loss of heat from the skin and stimulates the sweat glands so that there is a large escape of heat from evaporated moisture. An enhanced blood supply in the digestive organs favors improved digestive capacity and appetite.

**Excessive Exercise.**—What is considered excessive exercise depends upon many circumstances. In youth the heart is apt to suffer from continuous and violent exercise, as in prolonged, competitive athletic contests. If the strain is sudden and violent, the heart may become dilated and weakened; if continuous, the heart is prone to become an enlarged and overgrown muscle, so that it is too strong and powerful for existence in ordinary life, and not having enough resistance to overcome in sedentary occupations, may cause distress by beating irregularly and tumultuously. The enlarged and thickened heart may weaken in time and dilation occur. The valves of the heart are also sometimes strained.

The best exercises are those which develop the body generally by bringing into action large groups of muscles instead of small groups by special exercises. Moreover, in these exercises of large groups of muscles the beneficial action on the vital organs—already noted—is brought into play, while in the development of special muscles there is less effect on the vital functions. Thus running, swimming, rowing, wrestling, fencing, riding, boxing, dancing, are all good general development exercises.

It is also well to promote special development of any part of the body, which is naturally deficient, by means of gymnasium work adapted to the individual requirements. Any violent exercise is unwise after middle age.

Old age is largely due to the hardening and diminution in size of the arteries. Not only is this state favored by the strain on the vessels, caused by a pounding heart from violent exercise, but the dangers of hardening of the arteries are greatly increased when they are subjected to unwonted strain (apoplexy). Hard labor is indeed one of the chief causes of arterial hardening and it appears earliest in the manual worker. Arterial hardening must come sooner

or later, as it is synonymous with old age. Our aim should be to defer the change as long as possible, and limit it to as small an area in the body as may be.

**Exercise for Different Ages.**—The form of exercise which is most suitable for children consists in outdoor play which does not tax the nervous system as do exercises involving the precise movements necessary to the skilled use of tools. Then all the games and exercises calculated to promote general development, which we have noted, are advisable. When the nervous and muscular systems are well developed it is time for exercises requiring precision of movement to be undertaken, such as the handicrafts, special lines of manual training, the use of musical instruments, etc. The period, after which these exercises are suitable, is about the fifteenth year.

In young adult life there may be an excess of exercise, while the business man is too frequently chiefly occupied in sitting, eating, and sleeping. The young man should lose no chance of developing his body, for it is the aim of athletics to develop those qualities so necessary to any successful career—energy, strength, endurance, courage, alertness, persistency, and stamina.

He should walk when he may ride, he should run when he might walk, he should climb stairs when he can take the elevator. Swimming, skating, rowing, hunting, fishing, and dancing are open to him. Home athletics and exercises may also be his.

The various systems of exercises advertised often include the development of certain muscles by resisting movements with opposing muscles, while concentrating the mind upon the process. This may build up a strong physique but makes one "muscle bound" and unfit for skilled sports, where alertness and the bringing into action of many groups of muscles are requisite.

The various exercises, consisting in bending the body and movements of arms and legs, which are the basis of many systems and may be practiced at the home, are undoubtedly of value, but it is generally conceded that exercise to be most beneficial should at the same time be agreeable. This contradicts the favorite theory of our parents that the ax and chopping block should prove a sufficient pastime to the restless and play-loving youth.

Indeed this is the great bugbear of the prescribed exercise of the physician to the middle-aged patient. Exercise has become a lost joy and art and therefore a bore. One should not make a business but a pleasure of exercise. Walking is the cheapest and easiest form of exercise for the middle-aged and beyond. The mind should not be occupied with one's cares and duties, however, but one should "go about admirin' 'ow the world was made." Fatigue should be avoided, as the poisons developed in muscular fatigue are one of the causes of hardening of the arteries and old age.

It is often stated in books on hygiene that an adult should perform daily an amount of exercise equivalent to walking nine miles on a smooth level road at the rate of three miles an hour. This does not help the average individual much who does not indulge in pedestrianism.

The aim of exercise for the middle-aged and elderly should be the reverse of that proper for the young. The former should not run for a car, or upstairs, or carry a trunk, or undertake any unnecessary, violent exertion. Golf, motoring, riding, gardening, fishing, hunting, bird study, bowling, and moderate bicycle riding are suitable up to ripe old age. Such exercise as boxing, fencing, tennis, and hand ball induce too much nervous tension, while running, rowing, swimming and basket ball strain the heart and blood vessels. The safest exercise for the elderly are walking, carriage riding or motoring, and billiards.

However, for those who have kept in good muscular condition by constant exercise throughout their lives many of the more strenuous exercises may be followed to the end, as horseback riding. The writer knows a former member of our cabinet who played tennis well till long past sixty.

To attain longevity one must take an active interest in life. "Hold on to life and life will hold on to you." And again, the ideal life is to be "active as long as possible, and then die as suddenly as possible."

In this strenuous and muscular age it is malapropos to hint that arduous exercise may not be necessary to an active and healthy existence. A vast number of persons live active (as opposed to

sedentary) lives in perfect health, without taking exercise apart from that requisite to their vocations. The manual worker is of course not included in this category. Mental exercise appears to act as a substitute for muscular exertion. The banker and clergyman are more long-lived than the farmer, and the most noted thinkers, foremost leaders in business, professions, art, science, and literature have, more often than the Samsons, been numbered among the octogenarians.

There is no doubt that exercise in the open air is of the utmost value in youth in promoting general development of the mind and body, and that the country is the place to rear children. There is also no doubt that sudden and violent exercise repeatedly performed—as in competitive, athletic contests—or that overuse of certain muscles, are injurious.



## CHAPTER IV

### PERSONAL HYGIENE (*Continued*)

#### **HEREDITY**

Heredity, broadly considered, consists in transmission of certain characteristics from parents to offspring. More precisely, heredity is the transmission of properties through the union of the contents or plasm of the germ cells of the parents to form a single cell—the potential new individual.

By germ cells are meant those cells in the female which give rise to the egg or ovum in the ovary, and those cells in the testicle of the male which form the spermatozoön, the essential body in the secretion (semen) of this organ. Conception, following the sexual act, occurs when one spermatozoön in the semen of the male unites with one egg in the womb of the woman. The egg is set free from the ovary of the woman and finds its way down into the womb. It will thus be seen that the germ cells do not unite directly but indirectly through the products of the germ cells—the spermatozoön and ovum or egg.

The single cell formed by the fusion of the spermatozoön and ovum undergoes division into new cells. Some of these are set apart to form the germ cells in the offspring. The rest of the newly formed cells undergo great changes or are differentiated, so that they form such varied structures, as teeth, hair, nerves, etc., or all the structures of the new individual. But the germ cells situated in the testicle of the male or in the ovary of the female remain unchanged and are passed on from generation to generation without end—constituting the great marvel of heredity.

The infinitesimal plasm of the parental germ cells, which is contained in the new germ cells in the sexual organs of the offspring, is held in trust, until such a time as one of these germ cells unite with one of the opposite sex, and so in turn transmit its inherited characteristics to a new generation.

How much are these germ cells sequestered in the sexual organs of the parent affected by the life of the parent; in other words, how much may the life of the parent influence the physical character of the offspring?

The modern popularly accepted doctrine of Galton and Weismann does not recognize such a parental influence—this means that the acquired characteristics of the parent may not be inherited by the offspring. With this we do not, however, agree. Such characteristics acquired by the parent, as special muscular or mental development, or skill, manual dexterity, and, on the other hand, acquired defects or mutilations (amputations) cannot indeed be inherited.

The cutting off of tails in generations of animals, and the ritual circumcision of Jews through endless generations, do not lead to similar defects in the offspring. The same sort of peculiarities in animals (short tail) may, however, originate spontaneously and be transmitted regularly to posterity. Such peculiarities may be due to some accident in the fusion and development of the germ cells of the parent. Marked cases occur as freaks or "sports," such as a tulip possessing seven petals instead of the normal six petals.

In man we see like peculiarities in the webbed or short fingers and toes, and in the increased number of toes which are inherited in some families. Indeed, individuals possessing these peculiarities may often be prepotent, that is, may tend to transmit them in most cases even when mated with more normal individuals.

Reversion to a former type of ancestry is another cause of variation in individuals. Three types of reversion are recognized: first, the tendency seen in offspring to depart from the parental characters to that type common to their ancestry as a whole; second, to some particular ancestor; third, the reproduction of the original type of the first ancestors.

Atavism is used in the sense of reversion to ancient types, but it more properly refers to reproduction of remote ancestral conditions of as high or higher type, while reversion means reproduction in the offspring of characters of a lower type. As exaggerated types of reversion we have the rare occurrence of several breasts in women, and the occasional appearance of stripes in horses, suggesting the zebra and probably the original horse.

When individuals of different races marry, the offspring of the first generation may combine the characteristics of both parents, or resemble one parent in one respect and the other in another, but in the later generations there is a tendency in the offspring to revert to one or the other of the original parental types. Thus following the union of a white and negro, after several generations of mulatto or nearly or completely white children, there may be a black child born of white parents. In offspring of widely separated stocks, or of mongrels or half breeds, there is a marked tendency to revert to the original type of the species. In crossing two distinct breeds of pigeons Darwin found the offspring to possess all the characters of the wild pigeon. In the mating of a tame white mouse with a piebald Japanese waltzing mouse, von Giata reports the progeny to have been a wild gray mouse.

Degenerates are descendants of parents of the same stock who tend to revert to a lower type, in size and shape of head, and moral and intellectual development. Contrariwise, within certain limits, the crossing of distinct stocks may lead to a higher type of offspring.

For in Canada, Adami notes that the progeny of the mixed Anglo-Saxon and French are superior mentally and physically to the children of parents both French, or both Anglo-Saxon.

Children may inherit some characteristics from one parent and others from the other parent, as the coloring of one and the features of the other. The color of the eyes is often an exclusive inheritance from one parent. When one parent has light and the other dark eyes, their children will possess either light or dark eyes—rarely eyes of an intermediate color. When the parents markedly differ, the offspring may resemble but one parent. Again, the progeny may combine the characters of the parents—when they differ in any nota-



ble respect—as when the child of a very short and a tall parent is of intermediate height.

In the so-called blended inheritance the child more commonly occupies a middle position between the characters of the two parents, while sometimes the child is generally superior to the parents, and occasionally shows qualities possessed by neither. Then, as we have seen, the offspring may revert to a former type and be superior or inferior, or the child may exhibit some sport or freak not so readily explained.

At times the character of one parent lies dormant (recessive) in the offspring, only to reappear in a later generation, owing to the fact that some constituent of the germ plasm of one parent partially neutralizes or replaces the similar constituent in the other parent. But when the germ plasm of one parent is so powerful as to completely neutralize that of the other, the characteristics of the neutralized parent may never appear in later generations. There are certain remarkable laws governing inheritance which have been discovered by famous investigators as Mendel, Galton, and Pearson, but as these involve abstruse mathematical problems they will not be considered here.

Certain racial characteristics in regard to disease are transmitted by inheritance. Thus negroes possess a special degree of immunity to malaria, while on the other hand they are peculiarly susceptible to tuberculosis—indeed all savage people are more susceptible to the germ diseases of civilized races. Measles is an extremely fatal disease in aborigines.

Certain inheritances are peculiar to certain species of animals. Animals in general are immune to the contagious diseases affecting the sexual organs of man (syphilis, gonorrhea), and to typhoid fever.

Now let us turn again to the question of the inheritance of characteristics acquired during the life of the parent.

We may make the rather startling statement to begin with that no special disease is inherited. Those most often regarded as inherited diseases are syphilis and tuberculosis. As a matter of fact, children are very rarely born with tuberculosis and when they are it is because of infection from the mother's blood. True inheritance



would mean that the disease germ resided in the spermatozoön of the father or the egg of the mother at the time they fused to form a new cell or individual.

The germ cells of human parents do not contain microbes. To show the probability of the inheritance of tuberculosis from a consumptive father it has been found that there are not more than ten germs of tuberculosis in the semen of a consumptive. But in the semen there are some two hundred and twenty-six million spermatozoa. As only one spermatozoön of the male combines with one egg of the female to form a new individual, the chances of infection from a male parent are practically nil.

The same applies to other germ diseases. They are not strictly inherited; that is the microbes are not conveyed in the egg of the female and the spermatozoön of the male when they fuse at conception to form the new individual.

But it is well known that children of parents suffering from certain germ diseases are born with the same disease. How is this to be explained if the diseases are not inherited? In such cases the diseases are acquired by transmission of the germ from the blood of the mother to the child in the mother's womb; or germs of disease of the womb or sexual passages may enter the child while still in the body of the mother. When disease is thus acquired by the child, and not inherited, it is said to be congenital, or literally a "born with" disease.

While in the mother's body the child may acquire disease by entrance of germs into it during its passage from the womb at birth. In this manner do children become affected with that dangerous form of inflammation of the eyes which is the source of blindness in most cases when the child is said to have been born blind. Ten thousand cases of such blindness exist in this country to-day.

But while diseases are not strictly inherited, but acquired by the unborn child in the mother's womb, the child is vastly more influenced by the action of chemical substances on the germ cells of the parents.

Life itself is largely a matter of chemistry. The size, shape, and structure of organs are due to their chemical composition.

While the germ cells of the parents are not at all altered by maternal impressions either at conception, when the cells are free from connection with the body, or during pregnancy when the child is already formed completely (after the second month), yet they are tremendously influenced by poisons circulating in the blood of either parent. Here again one must distinguish between poisons in the mother's blood, which are conveyed directly to the child in her womb, and poisons which act on the germ cells before conception has occurred. Thus in the common form of poisoning in pregnancy, in which the mother has convulsions, the child also frequently suffers after birth from the same attacks, if not born dead. This is not a case of inheritance but of acquired poisoning of the child in the womb from the mother's blood.

We will, therefore, consider the influence of chemical poisons upon the germ cells of the father, for such cannot in any way enter the blood of the offspring before birth, as in the case of the child in its mother's womb.

There are three sources of such poisons in parents: poisons may enter the body from without, as in the case of alcohol; they may be commonly generated from within by the germs of disease; or they may be formed as the result of the internal secretions of glands.

The children of fathers poisoned with alcohol, lead, or mercury are born dead, die young, or suffer from poor vitality and often from epilepsy or insanity, and these diseases are passed on from generation to generation. Experiments by Stockton have shown the same result in animals. He mated twenty-four male guinea pigs (previously chronically poisoned by alcohol) with as many normal females. The progeny consisted of but five living guinea pigs at two months of age, seven having died of convulsions soon after birth. The average progeny of twenty-four normal pairs of guinea pigs should be about one hundred young.

The same results are seen in the offspring of human parents suffering from germ diseases, as syphilis. The children are fewer in number, are prone to be born dead or with monstrosities. They also have little vitality, die young, or are poorly developed, often have convulsions, and are epileptic or insane. These effects are

not due to having inherited the actual diseases from their parents but are due to the effect of the parental poisons on the spermatozoön or ovum.

In other words, the children have inherited acquired characteristics from their parents in that the germ cells from past generations have been altered by chemical poisons while in the bodies of their parents.

The natural secretions of many glands of the body contain chemical substances which have the most marvelous influence upon the growth and function of organs. Thus the wonderful change which occurs in the development at the time of puberty is in large measure probably due to the internal secretions of the sexual organ which are absorbed into the blood. The giant is the result of the secretion of the abnormal pituitary gland. Monsters, as cretins, are formed through the insufficient secretion of the thyroid gland in the neck. It is now known that conditions of these glandular organs acquired by the parents will so alter their germ cells that their children are apt to inherit allied conditions—the effect of chemical substances on the germ cell.

In consequence of both parents having goiter, the children are likely to be cretins. In goiter (an enlargement of the thyroid gland in the neck) there is deficient secretion. In the cretin the secretion is so slight that the child becomes hideously distorted, an imbecile, a dwarf, with great head, swollen protruding tongue and lips, large belly, and stumpy tottering limbs.

There is one more effect of the poison in the parent on the germ cells, whereby the offspring suffers, which should be emphasized. There appears to be an increased susceptibility, on the one hand, to the same diseases which in the parent caused the development of this poison, and, on the other, an increased susceptibility to the poison itself. Special poisons have a weakening action on special organs, so that the children of diseased parents are more susceptible to the diseases of their parents. It is the lessened resistance to certain diseases which is inherited rather than the disease itself. This is the explanation of so-called hereditary diseases. The tendency and not the disease is inherited. So with poisoning, the



children of alcoholics appear to be much more susceptible to the effect of alcohol than are normal persons.

When the parental system is poisoned by the products of disease, the nervous apparatus of the offspring is most apt to suffer since it is a law that the more recently developed organs in the evolution of man are the first to succumb to such injurious agencies, and the nervous system is the most recent product of bodily development.

Not only may the predisposition to a certain morbid acquirement of the parent be inherited by the offspring, but this characteristic is likely to appear at the same time of life at which it appeared in the parent. Certain natural characteristics are similarly inherited, such as the tendency to longevity. The best way to attain long life is to have had long-lived ancestors. The following diseases are those commonly said to be inherited, although, as has been stated, it is the tendency to the disease and not the disease itself which is transmitted. Nearsightedness, astigmatism, color blindness, deafness, obesity, diabetes, some forms of Bright's disease of the kidneys, gout (more often in the male line), rheumatism, syphilis, tuberculosis, cancer, some skin diseases, and especially many nervous diseases as neuroses, epilepsy, hysteria, paralyses, and insanity. The occurrence of albinos and bleeders may be attributed to inheritance.

Since the predisposition to disease may exist in those descended from a common ancestry, it follows that marriage between relatives is inadvisable because such tendencies may be doubled in intensity in their offspring. The likenesses existing between brothers and sisters is greater than between parent and child; while the relationship existing between first cousins is practically the same as that between great grandparent and offspring. The children of early and late marriages are not apt to be so robust as those resulting from marriages occurring at the most favorable time—the age of twenty-five for a man and twenty for a woman. There are many exceptions to this rule depending upon the health of the parents, etc.

It is said that the child inherits the features, shape of the head, sense organs, and constitution from the father, while the mental characteristics may be transmitted from either parent, the shape



of the trunk and internal organs more closely resembling those of the mother. Such a statement must be accepted with considerable salt.

**Summary.**—We have endeavored to show that not only are the chief characteristics of the parents transmitted in their germ cells from generation to generation, but also that acquired characteristics of the parents—especially due to chemical influences from without and within—may be transmitted to their offspring.

But what shall be said of the vast importance of environment? Persons are apt to be carried away by one side or other when considering the large subjects of heredity and environment. Are the sins of the father visited upon the children unto the third and fourth generations? To a certain extent this is true—especially the inheritance of nervous derangements. But while there are agencies in the blood of the parents which work injury to their germ cells and progeny, environment is capable of originating agencies benefiting the germ plasm.

Goiter has been mentioned and is seen in certain localities, due to the probable presence of certain living bodies in the water, and the absence of iodine. Change of localities may avert the same tendencies in the offspring. The children of tuberculous parents are very likely to acquire the disease, not through heredity, but through exposure to the germs of disease. Change of environment will prevent the disease in the children. Comparison of certain children reared in this country with their foreign parents will show the wonderful effect of environment in overcoming degeneracy and degradation. There is indeed a tendency in the young to assume a resemblance to a common type of people existing in the neighborhood and country, at the expense of inherited characteristics.

*Environment Versus Heredity:* On the one hand the sins of the fathers need not necessarily be visited upon the children if parents heed the warnings which such sins offer, and instead of neglecting the simple laws of health, make an effort to so train the bodies of their children that inherent weakness may be overcome. On the other hand, the tendency to slight the grave danger of hered-

ity and acquired disease in the offspring cannot be too seriously condemned.

Shall the knowledge that one in every eight persons in cities has syphilis; that eighty per cent. of all men in large cities have, or have had, gonorrhea; and that this disease leads to fifty per cent. of the involuntary childless marriages be denied? Shall such facts as are supplied by Fournier—that out of ninety mothers with syphilis, fifty had children born dead; thirty-eight bore children who soon died, and only two were able to bring into the world children who survived—be made light of? Ought not parents to realize the grave danger which their diseases and habits impose upon their offspring? Are the diseased, degenerate, and depraved to be admitted as immigrants to our country?

As regards family inheritance it will usually be found that with the aid of an intelligent physician, children may be so reared that the predispositions of the parents can in large measure be combated by proper feeding, environment, hygiene, and education. The subject of heredity is a vast, complicated, and still mysterious matter. We have herein merely touched upon some of its more salient features. With our increasing knowledge of heredity, and especially of preventive measures relative to disease, and with the general interest now aroused in eugenics or race culture, the outlook was never more hopeful for the future unborn.

## CHAPTER V

### HOW TO TAKE TEMPERATURE, PULSE, AND RESPIRATION— APPEARANCE OF THE TONGUE—HOW TO GIVE SUBCUTANEOUS INJECTION AND PASS A CATHETER

A knowledge of the temperature and rate of the pulse and respiration is the first essential of diagnosis in every medical case. In the following pages the reader is told how these facts may be ascertained.

**Temperature.**—The presence or absence of fever cannot be ascertained with certainty by feeling of the skin. Cold hands and feet may persist during fever. In fact, during the chill of ordinary malaria, when the surface is cold, the teeth are chattering, and the patient asks for hot drinks and heavy bedclothing, his temperature is at least  $102^{\circ}$  F.

To ascertain the real temperature, a clinical self-registering thermometer is essential; this may be purchased for seventy-five cents. It should be non-magnifying, or a "plain reading" thermometer, while physicians use a thermometer with a magnifying bulb which is difficult to read for those unaccustomed to them. The half-minute or one-minute thermometers are more convenient by reason of rapidity of registering, but their bulbs are more fragile.

The thermometer is provided with a scale, showing degrees divided into fifths, and generally running from  $90^{\circ}$  to  $110^{\circ}$  F. An arrow marks  $98\frac{3}{5}^{\circ}$ , which is the temperature of normal health. A temperature of  $100^{\circ}$  F., or over, denotes fever. A temperature below normal is sometimes seen in health, but unless it persists at  $97^{\circ}$  F., or less, it may be considered unimportant.

To use the thermometer, take it by the upper end, with the bulb containing the mercury downward, and swing it back and behind you vigorously, or jerk it through the air as if snapping a

whip. This handling must be repeated until the mercury descends at least as low as  $96^{\circ}$  F. The bulb of the instrument is then placed under the patient's tongue, and he is instructed not to close the teeth but to close the lips tightly around the thermometer and breathe through the nose. It must be left in this position for a minute more than it is marked; that is, a minute thermometer must be held in the mouth two minutes.

The thermometer may be placed in the armpit, which has first been wiped dry, and the skin or flesh of the arm grasped so as to allow no air to enter about the thermometer but so as to keep it pressed tightly between the arm and side of the chest.

In the case of children, to avoid risk of breaking, the thermometer may be inserted into the bowel (rectum) for an inch or two, the patient's feet being held in the air, and the instrument having previously been oiled. Although the child may cry, the operation is painless. Temperatures taken in the mouth or rectum are most accurate.

In unconscious or violent persons the temperature may be taken in the armpit. After removing the thermometer, the scale is read, and the instrument washed with soap and cold water, and put into its case. Hot water sends the column of mercury up to the end of the tube violently, and generally bursts the tube. In the case of contagious diseases it is safer to allow the thermometer to stand in a solution of two-thirds alcohol and one-third water for five minutes, after washing, to avoid conveying disease by the instrument to others. Temperatures in fevers are apt to be highest about five p. m. and lowest in the early hours after midnight. The hours of six and ten a. m., and four p. m. are good for temperature taking.

## PULSE

The pulse rate at different ages is as follows:

At birth.....	130 to 150
At 1 month.....	120 to 140
At 1 to 6 months.....	130
At 6 months to 1 year.....	120



At 1 to 2 years.....	110 to 120
At 2 to 4 years.....	90 to 110
At 6 to 10 years.....	90 to 100
At 10 to 14 years.....	80 to 90
Normal pulse in an adult.....	72

The preceding table shows in a general way the number of heart-beats in one minute. The pulse may be taken by lightly placing the tips of three fingers upon the wrist over the radial artery, which is to be felt on the front of the wrist, about half an inch from the edge of the thumb side and one inch above the base of the thumb. In children it may be felt by placing the fingers on the side of the neck under the ear, or on the left breast over the heart itself.

The pulse in children varies much, and increases on the slightest exercise or excitement. It is less rapid during sleep. The usual pulse of healthy adults varies considerably; it is rarely as low as forty and occasionally runs above eighty. In fever there is ordinarily an increase of eight to ten beats over seventy-five for each additional degree of temperature.

## THE RESPIRATION OR BREATHING

The rapidity of respiration in health per minute is seen in the following table:

From birth to the age of 3 weeks.....	40
From 3 weeks to the age of 1 year.....	30
During the second year.....	28
From the second to the fourth year.....	25
From the fourth to the fifteenth year.....	20 to 25
In adults.....	16 to 18

By a respiration is meant the inspiration (inbreathing) and expiration (outbreathing) taken together. In counting the respirations, place the open palm upon the chest, or in children and men upon the abdomen, and count each time the chest or abdomen expands, or merely watch the rise of the chest or abdomen. The falling movements of the chest or abdomen are not counted.

In children the breathing is often very irregular; a child may hold his breath and even take several breaths in rapid succession. Breathing is more rapid in fevers and diseases of the chest. In fever there is an increase of about one respiration to each three or four additional heart beats above the natural rate—seventy-two in the adult.

The breathing in grave cases of pneumonia may be as rapid as forty in adults, or sixty in babies. The breathing is noisy and crowing when there is any obstruction in the throat, as in diphtheria or croup; noisy and snoring in unconscious persons. (*See Disease of Throat and Cough.*)

### APPEARANCE OF THE TONGUE

In most cases the appearance of the tongue is not of much importance, the popular notion to the contrary notwithstanding. Any one will have a coated tongue if starving or taking fluids, since the coating will form unless kept worn off by eating or chewing. The coating is made up largely of cast-off cells.

When the tongue is coated it often signifies that the digestion is disturbed; but there are many persons in comparative health whose tongues are habitually coated. A yellow coating frequently signifies that the patient's digestion is disordered unless the tongue is stained by something in the mouth, as tobacco. Peculiar conditions of the tongue are characteristic of some disorders, however.

### THE HYPODERMIC SYRINGE

When a patient is suffering severe pain and is unable to retain drugs in the stomach, the injection of morphin under the skin is of great advantage. Many other drugs are best given hypodermatically, but only by a trained nurse or physician. Rapidity and certainty of action are also attained by this method.

A description of the mode of administering drugs under the

skin is here given for the benefit of those who may have the care of sick or injured persons and be unable to secure a physician.

Doctors properly consider it unwise to teach the laity how to use a hypodermic syringe because morphin is commonly taken with a syringe by habitués. In emergencies, however, knowing how to give an injection under the skin may be invaluable.

A hypodermic syringe usually holds about thirty minims, or drops, of water. The medicine used is commonly carried in the form of tablets, one of which is dissolved by placing it in a clean teaspoon, not more than a quarter filled with pure water. If a burning match or alcohol lamp is held for a moment under the spoon the water will quickly boil; this not only sterilizes the water, but hastens the solution of the tablet.

The syringe should be washed out by drawing up alcohol or boiling water into it a number of times through the needle, and the outside of the needle should be wiped with a clean towel wet with alcohol, or the needle should be dipped in boiling water. The water in which the tablet is dissolved is then drawn up into the syringe, including the last drop; then the syringe is held with the needle pointing upward, and by pushing in the plunger until the solution begins to flow out of the needle, all air is expelled.

The injection is generally made in the forearm. The skin on the front part of the arm, midway between the wrist and elbow, is thoroughly cleansed with soap and water and washed with alcohol, if at hand. A fold of skin is then picked up between the thumb and forefinger of the left hand and pinched firmly to prevent pain from the needleprick. Then with the syringe grasped in the right hand, the needle is thrust quickly into the fold of skin thus raised. The needle should be introduced one-half to one inch, almost parallel with the surface of the arm, into the middle of the fold of skin held up; not deep into the flesh of the arm. The liquid is slowly injected and the needle rapidly withdrawn.

The process is exceedingly simple and without danger, if the needle, syringe, and skin of the patient are clean, and air is first pushed out of the syringe. The metal syringes with solid plungers are likely to prove most satisfactory.

A patient should never attempt to use the hypodermic syringe on himself. Many drugs are administered with the hypodermic syringe, but morphin<sup>1</sup> is given most often in this way. Not more than a quarter of a grain should be injected at a time in adults, but if no relief is experienced within half an hour the same dose may be repeated. In weak women it is advisable not to give more than one-eighth grain at a dose. Morphin is to be shunned in troubles where pain is chronic, as the morphin habit is readily acquired, and overcome, if at all, only by decided force of will and much suffering.

### USE OF THE CATHETER

In case of retention of urine from various causes it may become necessary to use a catheter in order to relieve suffering, if not to save life.

A catheter is a flexible tube, generally of rubber, open at one end and often closed with a solid point at the other, but having an opening or eye near the closed end through which the urine may flow when introduced into the bladder.

There are two forms of catheter suitable for general use. The best is the soft rubber catheter, called also Nelaton's or Jacques', and the other is the more rigid, silk-web or English gum catheter. The soft-rubber catheter should always be selected in preference to the web catheters, unless the soft catheter cannot be passed, when the web catheter may be tried, but the stylet or wire, which is sometimes inserted in this catheter when bought, must first be withdrawn. If the catheter were introduced by unskillful hands, with the wire in it, damage to the organ might easily result.

The soft-rubber catheter should be boiled in water for five minutes before it is used, in order to kill any germs which may be attached to it. This is also the best way of preparing the silk-web catheters, but only the most expensive and finest make will stand boiling many times.

After using, catheters should be thoroughly washed in warm

<sup>1</sup> Morphin is only sold on a doctor's prescription and is a dangerous drug.



water and soap, and a stream of clean hot water be allowed to run through them. They should be kept wrapped in a clean towel or in a long case made for the purpose, and not coiled.

The solid point of the catheter containing the eye is the end to introduce into the urinary passage. The parts about the urinary passage in the male or female must be thoroughly washed with soap and water. The hands of the operator must be scrupulously clean. After thoroughly washing the hands it is safer to also wear surgeon's rubber gloves which have been boiled five minutes. The gloves should remain in the water until it is sufficiently cool and then the gloves should be partially filled with water, to facilitate putting them on. A glove on the right hand alone, which touches the catheter, will do. The object is to avoid getting germs on the catheter from the bare hand.

The catheter, after boiling, must not come in contact with anything except the urinary passage and the clean hands of the operator. A towel, which has previously been boiled, should be spread about the sexual organs of the patient to prevent the catheter from touching the skin or the bed.

The patient should lie down with the shoulders slightly raised and the thighs bent so that the knees are in the air. It is important that the patient should be relaxed and keep the mouth open while the instrument is being introduced. The penis of the male is grasped by the left hand of the operator, who stretches it upward toward the middle of the belly and separates the lips of the urinary passages with the forefinger and thumb of the same hand, while the catheter, which has been dipped into liquid vaselin or glycerin in a clean glass, is passed slowly and gently into the urinary passage. Or, as more convenient lubricants, we may squeeze some of the contents from a collapsible tube containing sterile vaselin, or the lubricant sold as K-Y, on the catheter before it is introduced. It is impossible to infect a patient in using the soft-rubber catheter if proper cleanliness is observed.

When the catheter enters the bladder the urine will begin to flow from the outside end of the catheter into a vessel provided for the purpose. After the bladder is emptied the catheter is with-

drawn while pinching together its outer end to prevent the urine which is contained in it from leaking out. In females, the urinary passage begins in a little depression, easily found if the outer folds are separated, directly above the entrance of the vagina. Catheterizing a woman is very easy if the entrance to the passage is seen. In case catheterizing is difficult in the male and the instrument sticks at some point, it must be withdrawn for a little way and then pushed in again, or a different size must be used. If this is not successful the more rigid silk-web catheter may be tried, but no metal instrument should ever be introduced by an unskilled person.

The average size of catheter for the average patient, male or female, is No. 15 French, 8 English, or 10 American, according to which scale is used. A short glass catheter is often used for women, but the soft-rubber catheter is by far the best instrument. If voluntary passage of urine is impossible the catheter should be used about once in eight hours.

The chief danger in using catheters is the introduction of germs into the bladder causing inflammation of that organ. Only absolute cleanliness will prevent such a result.

## CHAPTER VI

### DISEASES OF CHILDREN

Inflammation of the breasts. Retention of urine. Phimosis. Hemorrhage in the newborn. Prolapse of the bowel. Wasting. Soreness, swelling, and pain in legs. Fever. Enlarged glands. Rickets. Holding the breath. Chorea. Pott's disease of the spine. Lateral spinal curvature. Hip disease. Bow-legs. Knock-knees. Weak and flat feet.

The larger number of diseases of children are common to adults as well, and may be found in other parts of the book by consulting the index. Special mention has been made of any peculiarities of these diseases which may occur in children.

#### **INFLAMMATION OF THE BREAST OF THE NEWBORN**

This is not uncommon. The breasts of either girl or boy babies become swollen and tender, and a few drops of thin milk may exude from them. Ordinarily the child's temperature is not above normal, nor is the appetite disturbed, and these cases subside without causing any trouble.

The breasts should be gently and thoroughly washed with soap and warm water, and then covered with a few layers of cheese-cloth, which has been spread with a mixture of one part ichthyol and three parts zinc oxid ointment, and then with oil silk and a flannel band about the chest, with shoulder straps to keep it in place. Wet dressings are not advised. Attempts at massage and squeezing out the milk are sometimes the cause of abscess.

If abscess of the breast results there are increasing inflammation and redness, formation of matter (pus) and fever, loss of ap-

petite, and general disturbance. Such a case must of course be referred to the surgeon at the earliest moment for incision.

### RETENTION AND PAINFUL PASSAGE OF URINE

The baby may pass no urine for twenty-four hours after it is born, and yet there may be no cause for worry. If no urine is passed in the first twelve hours, it is well to put the baby in a warm bath, and if this does not lead to a passage of urine a doctor should be consulted, as there may be some deformity or obstruction.

Very rarely there is no opening for escape of excrement from the bowels, and this is first brought to the attention by failure of the child to have a bowel movement. A surgeon must be summoned at once to remedy this condition.

No urine is passed for many hours after a bad attack of colic in some cases, but this condition may be relieved by the warm bath.

Pain during the passage of urine may be observed when the urine is too concentrated and stains the diaper with a reddish or yellowish substance. Giving the baby an abundance of water will relieve this condition.

### SMALL OPENING IN THE FORESKIN FOR PASSAGE OF URINE

(*Phimosis*)

This is seen in the newborn boy baby as a natural condition. The opening is not only small as a pinhole, but the foreskin cannot be withdrawn so as to expose the head of the penis. Naturally, this state changes as the child grows, but if it does not, and the foreskin remains attached to the parts beneath and cannot be moved freely over the penis, and if the opening for the passage of urine is very small, several bad results are apt to follow.

The end of the penis is likely to become sore, red, and swollen, and the passage of urine painful. Some discharge may occur. The



irritation leads to rubbing of the parts, and the bad habit of masturbation often thus begins. Bed-wetting is a common sequence of the irritation. Prolapse of the bowel or rupture may be caused by straining to pass water. Various nervous disorders owe their beginning not infrequently to a narrow foreskin, such as convulsions, St. Vitus's dance, fever, general ill health and nervousness.

It is the custom in many hospitals and in private practice for the nurse to daily draw back the foreskin of the infant, until by the end of the fourth week it may be drawn back over the head of the penis, and the natural greasy secretion washed off. This is a good way to teach the child self-abuse and occasionally the foreskin cannot be returned, on account of swelling of the organ, so that it must be cut. Stretching of the foreskin is also advised in place of circumcision, but the original narrowing of the entrance is sometimes made worse by this operation.

The writer is a firm believer in circumcision for every male child within a few weeks of birth. It does away with the necessity of the nurse manipulating the organ in order to cleanse it and, in preventing any sort of irritation, it is the best preventive of masturbation.

**Treatment.**—This consists in circumcision, that is, cutting off circularly a portion of the end of the foreskin. Parents should consult a physician when there is any suggestion of trouble such as has been described.

## **BLEEDING OF THE CORD AND SORENESS OF THE NAVEL IN THE NEWBORN**

Bleeding of the cord occurring soon after birth must be stopped immediately by tying a soft string tightly about it, as far from the belly as the string will remain without slipping off. Slight oozing after the cord has dropped off is usually of no consequence.

There is, however, a rare form of bleeding from the cord appearing within the first few days after birth which nothing has hitherto been able to stop. Bleeding may also occur at the same

time from the bowels, nose, mouth, and other parts. It is a peculiar disease of the blood and has heretofore been very generally fatal. Now it is almost invariably cured by the injection of the blood of one of the parents, brothers or sisters. Sometimes the cord will become soft and offensive, and when it comes away will leave a large sore behind it. There may be a little pea-shaped swelling in the sore which discharges matter.

**Treatment.**—In the absence of a physician the cord or sore should be washed three times daily with boric acid solution (one teaspoonful to one-half pint of warm water) and clean absorbent cotton, and then dusted with a mixture of two drachms each of boric acid, starch, and zinc oxid, and six grains of salicylic acid, and covered with clean gauze or soft cotton.

### PROLAPSE OF THE BOWEL

This condition is brought about by great or constant straining caused by diarrhea, constipation, a narrow foreskin with difficult urination, worms, whooping-cough, overeating, with too frequent large movements of the bowels, etc. A protrusion of the bowel from one-half inch to several inches long is to be seen. Ordinarily it presents the appearance of a dark-red or purplish, puckered ring at the point of the opening of the bowel which goes back or can be pushed back into place. It reappears, however, whenever there is much straining, as during a passage from the bowels. There is generally little pain connected with the trouble, unless the protrusion is large, when—if it remains out for a considerable time—it becomes very painful, inflamed, and may ultimately die and cause the death of the patient.

**Treatment.**—This consists in removing the causes if possible. In many cases keeping the feces soft with albolene (see Constipation) and refusing the child all food between meals, with the use of cold sponging, may bring about a cure.

The first thing to do is lay the child flat on his face, cleanse the protrusion with warm water, grease it with vaselin, and push

it back. The injection of a little ice water into the bowel (a cupful three times daily) will have a most beneficial effect.

To prevent a return of the trouble the child should be required to have a movement while lying on its back on a diaper or bedpan, or by employing a board, having a hole only three inches in diameter, which is placed over a chamber vessel for the child to sit upon when the bowels move. A baby must not be allowed to sit upon a vessel more than five minutes at a time; there is no more pernicious habit in causing prolapse of the bowel than a long session at this occupation. Special apparatus and operations are necessary to cure chronic or large protrusions of the bowel.

## WASTING

(*Marasmus*)

This is a condition of infants seen more often during the first year, and is due to various causes. More frequently it occurs in bottle-fed infants, who receive improper food, as rich milk, patent foods, cereals, or even vegetables, meat, or bread, during the first months of life. The child is starved because it cannot digest such food. The usual history has been that the baby would not take mother's milk, was then given cow's milk which was too strong or too large in amount, and this not agreeing with him, experiments in various patent foods were tried. The result is that at the age of six months the baby weighs less than at birth. Such babies either are born with an inability to digest cow's milk or have grown into this state through improper feeding.

The skin is sallow, wrinkled, and hangs in folds. The eyes are sunken, and the lips thin and pale—the patient looks like a little old man. There are sore patches about the buttocks and inner surface of the thighs; the appetite is often voracious; the tongue is heavily coated and dry; colic is frequent, and the passages are composed of curds or little lumps covered with greenish slime. Sometimes diarrhea and vomiting are present. The baby cries much or dozes a great deal; it often sucks its clawlike hands until they are



raw; rolling and squinting of the eyes and spasms are common in bad cases. The temperature is generally below normal.

Milder forms of wasting are seen in breast-fed infants, when the milk is too poor and insufficient to nourish the child, or too rich to be digested. Indigestion and lack of cleanliness in the care of the bottles and nipples also favor marasmus.

It is often seen in babies born with syphilis, but in them are signs of inherited syphilis, as continual snuffles, hoarse cry, moist patches about the mouth and the rectum. Cracks about the mouth and a flattened bridge of the nose are also common to this condition. Tuberculosis may likewise cause wasting in infants, but in this disease there is a temperature of 100° to 101° F. or more, and cough.

**Treatment.**—The essential treatment consists in obtaining a wet-nurse for the infant. Nothing else will take her place.

After being fed on a bottle it may be difficult to get the infant to nurse. By waiting an hour or two after the usual feeding time, by feeding the baby in the dark, and by placing a little sugar and milk on the nipple, the child may be induced to nurse. Giving barley water before meals, if the baby is inclined to get too much milk, or after nursing, if the child gets too little, will make the milk more digestible. Weighing the baby before and after nursing will show the amount of milk taken.

An outdoor life is important and great heat should be avoided. Rubbing sweet oil over the body, after sponging with warm water night and morning, will be found beneficial.

If a wet-nurse is an impossibility, feeding with barley water and later with small quantities of milk or cream added to barley and milk-sugar water is advisable, but must be directed by a doctor. The greatest care and experience are required in such cases, but no patient is too sick to recover.

### **SORENESS, SWELLING AND PAIN IN THE LEGS—GROWING PAINS**

When infants cry out if they are moved, it is suggestive of scurvy or influenza (if fever). Older children suffering from pains



in the limbs—often, through ignorance, called “growing pains”—are victims of muscular or acute rheumatism in many cases. Enlargement and disease of the tonsils produce growing pains from general poisoning of the system, and these may be cured by removal of the tonsils.

Kerley describes a condition, not uncommon in children, in which growing pains, enlarged tonsils, periodic attacks of vomiting, and a tendency to croup, colds, eczema, and hives are observed.

He states this may be cured by giving children only skim milk, or buttermilk, and avoiding the yolk of egg and sugar. The white of egg, cereals, vegetables, cooked fruits, and a moderate amount of meat, poultry, and fish are allowed. In place of sugar a little saccharin may be used. A daily bath in warm water should be given at night and then cool (and gradually cold) water should be dashed over the body while the child stands in warm water.

## FEVER

Fever is only a symptom of disease, but until it is known to what it is due the same general treatment may be pursued in all cases.

The first thing to do is to take the temperature with a thermometer, as described in the preceding chapter. This is the only way to be sure of either the presence or degree of fever—no other signs are conclusive. A temperature of less than 101° F. might be called a slight fever; between that point and 103°, a moderate fever. High fevers are much more common in children, and are not of so serious import as in adults, unless continued. A temperature of a hundred or over always means some sort of a physical disorder; no single test is so reliable in determining whether a child is sick or not.

Fevers lasting for a few days are not so harmful as commonly fancied, unless the temperature is high. Fever is nature's method of combating the cause in most cases, and moderate fever, unless it continues for many days, need not cause anxiety, so far as the increased temperature itself is concerned.

High fever—especially in children—should be reduced, since

headache, delirium, and, in infants, convulsions are not uncommon. A child with fever should be immediately isolated in a room by himself until it is known that the disease is not contagious, as the eruptive diseases of childhood, tonsillitis, grip, infantile paralysis, and diphtheria are often first made apparent through fever.

**Treatment.**—When fever is high, cold applications should be kept on the head. This is best secured by the rubber cap made to contain cracked ice, but if this cannot be obtained, a single thickness of soft cotton wrung out of ice water should be placed on the forehead and frequently moistened with ice water as it evaporates. The application of the cloth or ice cap ought to be continued as long as the fever remains high. Cold water may be applied by sponging the entire surface of the body while a hot water bottle is kept at the feet. The higher the fever the cooler the water should be. Ordinarily water at about 70° F. may be used. The sponging should be continued for five or ten minutes, the surface is then thoroughly dried, and the patient covered moderately. Heavy covering is always bad in fevers. Sponging may be repeated every two hours if necessary, but should not be employed unless in a warm room—70° F. or over. When there is an eruption, sponging with lukewarm water is advisable, in a warm room. It is not necessary to reduce the temperature below 102° F. in most cases.

The diet in fever must be liquid; infants on milk diet should have the mixture diluted one-third to one-half with water. Milk, broths, albumen water, and thin cereals constitute the best diet, as a rule. An abundance of cool water may be allowed in fevers, but a little at a time and frequently, is the rule. Rest in bed is imperative. Moving the bowels is also good practice in these cases; castor oil or calomel are commonly used, or other suitable cathartic may be given. If vomiting is present, the giving of any food for twelve to twenty-four hours should be avoided.

## ENLARGED GLANDS OF THE NECK AND OTHER PARTS— TUBERCULOUS GLANDS—SCROFULA

Glands are natural structures, but are not usually perceptible to sight or touch unless enlarged by disease. There are some eight hundred glands in the body and, of these, three hundred are in the neck alone and form a sort of collar, although four-fifths of them are on either side of the neck behind the lower jaw.

Glands are part of a drainage system (lymphatic system) consisting of fine tubes, much finer than the blood vessels, which drain the tissues all over the body and finally empty into the blood. Glands occur in the course of the lymphatic system, acting as traps do in household drainage systems, and in the body to catch germs, and the poisons they produce, and prevent these from passing along into the blood and entire body. When the glands are diseased, as in enlarged tonsils, the germs may pass directly through the tonsils and become caught in the glands of the neck.

Germs gain entrance to glands through wounds, sores, abrasions, and inflammations in various parts of the body. Enlarged glands of the neck are more common than elsewhere because inflammation about the throat, nose, and mouth is so frequent. The glands in the neck drain all parts of the head, the face, scalp, inside of the nose, mouth, and upper part of the throat. Then all the glands under and behind the jaw and in the back of the neck drain into the deep glands in the side of the neck; hence the frequency of swollen glands in this location.

Enlarged glands are seen and felt usually as movable lumps under the skin, and may or may not be tender. In the neck, as has been indicated, they may be found below or behind the jaw, below the scalp at the back of the neck, and along the sides of the neck. Enlarged glands in the armpits arise from inflammation in the hands, arms, or chest; enlarged glands in the groins (where the upper and inner part of the thighs join the body) are caused by inflammation in any part of the legs, or external sexual organs.

In the neck enlarged glands are due to inflammation of the tonsils,



adenoids, sore mouth, sore tongue, bad teeth, to abscess of the ear, and to the presence of lice and eczema on the scalp. Sore throat from any cause, particularly tonsillitis, diphtheria, and that common to the acute eruptive diseases, as measles, German measles, and scarlet fever, are the most common causes of enlarged glands.

But swollen glands from all these causes are temporarily swollen for a few days or weeks and then disappear. Enlarged glands occur more frequently in children between the ages of four and ten, and we will find them existing in a majority of children during this period.

In cases where these glands have been continuously enlarged for months or years there is usually also an infection with tuberculosis. In other words these glands have perhaps become enlarged through the causes mentioned above, and secondarily infected with tuberculosis, because, being already diseased, they afford an inviting field for further disease. There is no way of telling how badly such glands are infected with tuberculosis, but it is safe to regard chronically swollen glands in children as being tuberculous or scrofulous, to use the old term.

Swollen glands arising from diseases with sore throat appear rapidly, are often quite tender, but rarely form abscess, and vanish spontaneously. Tuberculous glands develop slowly; one or more lumps but slightly tender appear in the neck and tend to gradually increase in size and number and, after months or years, may become red and sore, soften, and form abscesses and leave a chronic oozing hole in the neck.

Tuberculous glands are not necessarily incurable, in fact most of them are cured by proper treatment without operation. Diseased tonsils allow the tuberculosis germs to penetrate through them into the glands in the neck, the germs entering the mouth in dust, on various objects sucked by children, and in food, especially milk from tuberculous cows.

**Treatment.**—The first object in treating glandular enlargements in the neck in children is to remove sources of infection in the throat—and these are chiefly diseased tonsils and adenoids. Attention should also be given to decayed teeth, and the condition of the



nose and mouth. Any diseases in these parts must be remedied.

Then the child should be given an outdoor life in the country, if possible, and should receive especially nourishing food, as pasteurized or certified milk, cream, eggs, meat, oatmeal, purées of dried peas or beans. The syrup of iodid of iron is often of value, more particularly if the child is anemic. This is given in a dose of fifteen drops in water three times daily after meals to children over five. Iodin petrogen may be rubbed night and morning on the glands for five minutes, unless they are sore or become so, when the treatment should be stopped for a few days. The use of the x-rays and injections of tuberculin have been successful in the hands of some experts.

There has been much discussion in the profession as to the advisability of removing glands in the neck in children, by the knife. Many well-recognized children's specialists advise this. But the leading surgeons to-day do not advise surgery on glands in children until they have been given the treatment recommended above.

It will be found that the majority of children with tuberculous glands will wholly recover, and the glands disappear, with removal of enlarged tonsils and adenoids, combined with life in the open and nourishing diet.

If, however, the enlarged glands persist and grow in size and number, or if the glands soften and become filled with cheesy matter or pus, then the surgeon must step in. The proper operation comprehends the removal of all the glandular tissue on one side of the neck from the ear to the collar bone, through one long incision.

Until recently surgeons removed only a portion of the glands, and more soon appeared, and it was commonly said "the glands have grown again." This, like the recurrence of tonsils after operation, means simply that the glands were only partially and imperfectly removed. Glands do not return after complete removal any more than a leg. When not wholly removed the remaining glandular tissue may become diseased and present the appearance of new glandular growths. The scar too is very slight and unnoticeable by the modern operation.

Tuberculous glands often occur in the chest in children and are

a common cause of tuberculosis in them. The glands in the neck are not, however, directly connected with those in the chest, as formerly thought.

## RICKETS

Rickets is a common disease of infants (occurring in fifty to eighty per cent. of babies) between the ages of three months and two years, among the less favored classes in large cities.

It is essentially a disease caused by improper diet—usually in infants fed on sterilized, condensed milk, proprietary foods, or on cow's milk not properly diluted to suit the digestion. Rickets may be found in children when nursing from the breast, but in these cases the milk is found to be deficient in composition—chiefly in proteid, and often in fat. When an infant nurses from the breast for more than nine months the milk will usually be found deficient in quality. Babies who are fed only on milk when over a year old, or largely starchy proprietary foods, are prone to rickets. No infant who receives a well balanced diet and assimilates it will develop rickets.

Rickets, like pellagra, is apparently due to a diet deficient in proteids (small vitamins) and perhaps fats, and there is evidence to show that sufficient phosphorus is also lacking, as in beriberi and other nutritional disorders. In rickets there is absorption of bone already formed, and impairment in the bone-making functions, so that lime and salts are not readily assimilated.

No single symptom will enable us to diagnose rickets: only the general picture is characteristic. The infant is pale and puny, with soft, flabby flesh. He seems sore on being handled, and often has a temperature of 100°-101° F. at night. The head is large for the body and feet, teething is much delayed, and the soft spot in the top of the skull may not close until the third or fourth year. Normally the first teeth (the two lower front teeth) appear from the sixth to the eighth month, and the soft area in the top of the head is closed with bone by the twentieth month. The baby is fretful, subject to colds, does not sleep well, and sweats about the head and neck at night.

The chest is often deformed so that the breast bone projects (pigeon-breasted), there may be a horizontal groove about the sides of the chest, and the spine may be bowed. There is often a vertical row of little lumps on the ribs on either side of the breast bone. The child is pot-bellied and bow-legged, less often knock-kneed. There is a tendency to attacks in which the child loses its breath and gets black in the face, and convulsions are not infrequent. The normal child's head increases in circumference about four inches the first year, three inches the first six months, and but one inch the second year. When the growth is much greater the case is apt to be one of hydrocephalus rather than rickets.

**Treatment.**—If the infant is being fed on cow's milk it may be too rich and should be properly diluted. Orange juice should be given with pasteurized milk (p. 255). Artificial foods and condensed milk must be discontinued. After the first year meat juice, scraped beef, oatmeal, boiled egg, and butter should be added to the milk diet. Pure cod-liver oil in doses of ten to thirty drops at six months, or from six to twenty months, twenty to sixty drops (or a teaspoonful), given three times daily after meals, is most beneficial.

The baby should be bathed in a brine bath at night, consisting of water at 95° F. to which is added a level tablespoonful of salt to the gallon. Following this two teaspoonfuls of lard or cocoa butter should be thoroughly rubbed in the skin for ten minutes.

If there is deformity in the legs or back the child should be kept on his back most of the time, not being allowed to stand until at least three or four months of treatment have elapsed. There should be plenty of fresh air in the room.

Too much sugar, bread, potato, and starch food generally favor rickets. After the second year purées of dried peas and beans are advisable, and plenty of butter.

The child should be outdoors in the carriage whenever the weather permits.

Braces for bow-legs are of little service, but correction is done by operation after the third year. Curvature of the spine is best treated by rest in bed, massage, and exercise, not by braces, plaster jackets, etc.



**SPASM OF THE LARYNX—"HOLDING THE BREATH"**

This rather rare nervous disorder often occurs in children of six to eighteen months (occasionally later) with malnutrition and rickets. At other times the cause cannot be discovered.

The attacks are most apt to come on if the child is scolded or stopped from doing something, after fright or crying, also after swallowing or exposure to draughts. The condition is due to sudden spasm of the muscles of the throat so that the air passage is temporarily closed.

An attack usually comes on during crying. There is a struggle for breath, the child makes whistling noises, the face becomes red, then bluish, and the breathing suddenly stops. Just when suffocation seems imminent, the breath is drawn in—with a crowing sound in many cases—and the attack is over with the passing away of the spasm in the throat. The whole attack is ordinarily a matter of seconds. Similar attacks are apt to occur many times during the day.

In severe attacks the child appears to fall into a faint and is wholly relaxed and unconscious for some seconds to a minute or two, or convulsions may appear. These are the dangerous cases, and death has been known to occur. The lightest cases are those in which children with rickets awake during the night with difficult breathing, causing a crowing sound when they draw in their breath. Taking the cases as a whole, recovery is the rule and danger is slight. Usually the attacks continue at widely varying intervals for several weeks.

The disorder is more frequent in England than the United States. It is not associated with either cough or hoarseness.

**Treatment.**—In mild attacks hold the child upside down and slap him on the back. If he does not immediately recover, dip him alternately in hot and cold water. A physician should be sent for at the earliest moment because it may be necessary to put a tube in the throat or to do artificial respiration to prevent suffocation.

These attacks, like convulsions, are due to an insufficient develop-



ment of the brain centers which resist the effects of nerve irritation. The aftertreatment is similar to that advised for convulsions.

All sources of irritation should be removed, as adenoids, worms, constipation, and tight foreskin. Inflamed gums may require lancing in difficult teething. Patients must be kept quiet and not be subjected to loud talking, rough playing, or receive too much attention from adults. The diet and general care should be that advised above in the treatment of rickets.

## CHOREA

(*St. Vitus's Dance*)

This is a nervous disorder chiefly affecting children between four and sixteen; it occasionally attacks pregnant women. It is twice as frequent in girls as in boys.

**Causes.**—Grief, fright, a severe scolding, overwork at school, eyestrain, anemia, or malnutrition are among the exciting causes. A strong tendency to the disease exists in certain families. There is a close relationship between chorea and rheumatism. Rheumatism occurs in about fifty per cent. of cases. It is thought that the same germ (and its poison) which causes the changes in the joints and heart in rheumatism influences the brain to produce chorea. Acute rheumatism sometimes begins with chorea, and at other times chorea occurs during the course of acute rheumatism or follows it, at longer or shorter intervals. The great danger in chorea, as in rheumatic fever, lies in the probability of being followed by chronic valvular disease of the heart, which has been found in fifty per cent. of patients who had suffered from chorea.

**Symptoms.**—Chorea generally begins gradually. The child becomes fidgety and cannot sit still, cries easily, and often has night terrors, pains in the limbs, stomach ache and other digestive disturbances. The patient is apt to be misjudged as being willful, and after a time appears awkward, and frequently trips and falls in walking, upsets or drops things at the table, or has an unusual hesitancy in speech.

Then the characteristic feature of chorea begins in twitching of

the muscles of the hands, arms, and face, and—to less extent—of the legs. Sometimes only one side of the body is affected. The face is wrinkled and contorted with grimaces, and the arms are jerked about in the most irregular fashion, which cannot be prevented by the patient. The movements may be almost continuous, or with long intervals of quiet, and are much worse when the patient is nervous or tired. The limb affected is much weaker than its fellow, and there is a loss of power to direct its use. Thus the child cannot place the tip of the forefinger of the affected arm quickly on the tip of his nose, and the hand-grasp is weaker than that of the sound arm.

In severe cases the patient is unable to walk, talk, feed, or undress himself without assistance—so violent are the movements. The twitching of muscular contractions cannot be stopped by control of the will, while habit spasm (in which the child acquires the habit of grimacing or jerking the head to one side, especially when tired or excited) may be arrested by exercise of the will. The spasms cease in sleep.

The disease tends to run a somewhat uncertain course of six weeks to six months, with recovery, under proper treatment. Chronic heart disease may persist. A return of the disease is not uncommon—more often in the spring. A varying degree of mental weakness accompanies chorea, from a state of deficient memory, fretfulness, irritability, and incapacity for brain work to a condition of temporary insanity in rare cases.

**Treatment.**—The child must be taken away from school to avoid all mental application as well as ridicule and excitement. He should not be subject to punishment for the movements, grimaces, or dropping things.

Rest in bed from one to four weeks is required for severe cases when the twitching interferes with walking and eating. Avoidance of physical and mental fatigue and excitement is essential. In the milder cases the child should live outdoors with a nurse or parent, and not play with other children. Rest in bed for part of the day is advisable. Horseback exercise, shooting at targets, croquet, and outdoor exercises not requiring violent exertion and free from excitement, are desirable. In the case of patients confined to bed a gradual

return to ordinary life should be required, getting up for a longer time each day.

The drug treatment consists in the use of sodium salicylate and baking soda, as advised in acute rheumatism. (Part III, Chapter VI.)

Diseased tonsils should be removed. Candy must be forbidden, and meat taken but once every other day. As relapses are frequent the patient should be under the constant supervision of a physician.

### POTT'S DISEASE

*(Angular Curvature of the Spine—Tuberculosis of the Spine)*

**Causes.**—This is a disease caused by softening and destruction of a portion of the vertebrae (bones of the spine) due to the germs of tuberculosis. It is a tuberculosis of bone. There is often the history of a blow on the spine, or of a fall, and the disease more frequently follows one of the diseases of childhood, as measles, whooping-cough, scarlet fever, etc. Pott's disease is thought to spread from tuberculosis of the glands in the chest or belly.

**Course of Disease.**—It begins more frequently in children between the ages of three and five, although often at other periods. If it goes on without early treatment it causes death eventually in about one-fifth of all cases, or leads to deformity of the spine, or humpback, and many other conditions, as abscesses in the groins and back, paralysis, etc. The seat of the disease is more often in the upper two-thirds of the back.

If, on the other hand, treatment is begun at the onset before there is any (or but slight) deformity, the disease is frequently cured completely. It is of the chiefest importance then for parents to recognize spinal disease at the earliest moment.

**Symptoms.**—The disease begins slowly. Before any definite symptoms present themselves the child appears fretful, lies on the floor, and is loath to stand or play, and often has a cough or pain in the abdomen. The chief symptoms are pain, stiffness of the back, awkwardness in moving, weakness, and deformity. Pain is not felt



in the back usually, except when jarred, although at night the child often cries out in his sleep, owing to unconscious movements. Neither is tenderness on pressing the spine common, but chronic pain is felt more often in both sides of the belly, as stomach ache and colic.

Stiffness of the back is a very important sign. The child does not bend his back freely, but carries himself stiffly, and when he stoops to pick up anything, squats down by bending the legs at the knees and hips and leans forward with his hands on his thighs to aid in straightening up. Weakness is shown by the child's dislike to stand or walk. He tries to hold on to something for support, totters about on his toes, and falls frequently. He walks with a shuffling gait to avoid jars, and with squared shoulders and head thrown back.

To test for stiffness in the neck, get the child to sit with his back against a support and to move the head far to one side and then to the other, and to nod the head far forward and backward. To test for disease in the upper part of the neck mark the bony prominences all the way down the spine, with the child on his face. If two or more marks are especially separated from one another, in standing, it shows trouble in that part. To test for diseases in the lower part of the back lift the child, lying naked on his belly in bed, by his ankles. If there is stiffness in this part it will be shown by the chest being lifted from the bed and the small of the back not becoming more hollow.

Deformity is usually the first sign which calls attention to the real nature of the disease (unless the parents are awake to the possibility of the trouble) and this is unfortunate because it is essential that a physician should treat the child at the earliest possible moment. The deformity is seen as a knuckle-like projection in some part of the back, and is made much more noticeable by bending the back. Occasionally there is a curvature of the back caused by rickets, but in this case the spine is bowed outward through a great part of its length, and the deformity disappears with the patient lying on his face. In rickets there are other signs, as enlargements of the wrists and beadlike swellings on the ribs.



The temperature in Pott's disease, or tuberculosis of the spine, is apt to range from  $99\frac{1}{2}^{\circ}$  to  $100^{\circ}$  F. If the spine in the neck is diseased, the shoulders are apt to be held high and there is often a chronic stiff neck, while if in the lower part of the back the child is apt to lean forward with the hands resting on the thigh.

In adults, Pott's disease begins with headache, backache, and a belt-like pain about the abdomen, or paralysis in the lower limbs.

**Treatment.**—The treatment consists in absolute rest in bed, or in transporting the patient about on a canvas stretcher in the early stages of the disease, or in the use of supports for the back, or in an ingenious operation (Albee's) for splinting the back by inserting a piece of bone from the leg into a lengthwise cleft in the spine.

There is great need for the parent to be able to even suspect the disease in its early stage so as to call the attention of a physician to it at this time—hence the rather elaborate description of early signs and symptoms.

## LATERAL CURVATURE

**Causes.**—This disorder differs entirely from the last described. Lateral curvature of the spine is a deformity of the body due to a bending or bowing of the spine to one side, so that instead of being straight it assumes somewhat the shape of the letter S. Not only is the spine bent to one side, but owing to certain causes it is turned to some extent on its axis.

In the beginning, this distortion of the spinal column is not usually brought about by disease of the spine itself although sometimes in children with rickets the softer bone favors the deformity—but arises from causes which tend to pull, more or less constantly, the spine out of line, and, occurring at an early age when the spinal structures are very pliable, permanent distortion results with gradual changes in structure of the bones of the spine (vertebrae) in consequence. It is very important, then, that this condition be discovered before actual structural changes occur, because the disease may be overcome, and incurable and lasting deformity can be prevented.

Among the causes are all sorts of circumstances leading to faulting positions of the body, as improper arrangement of school desks and chairs of bad shape; carrying heavy weights constantly in one hand or arm, as children carrying books and babies; certain occupations, effects of clothing, diseases, as faulty sight or hearing, requiring bending of the head and body to see; paralysis of muscles on one side of the body; loss of one arm; rapid growth; rickets, etc.

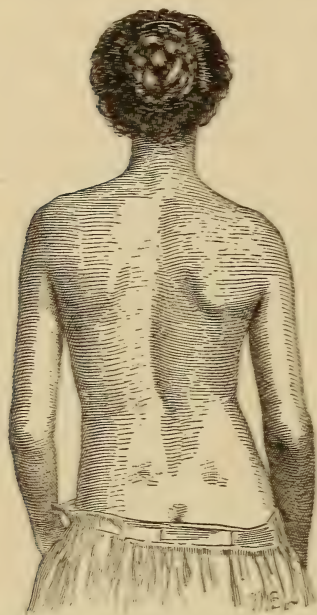


FIG. 47.—LATERAL CURVATURE OF SPINE. Bowing of spine to left; right shoulder lowered, right hip raised. (After Kelley's "Medical Gynecology.")

**Symptoms.**—Lateral curvature is much more frequent in delicate girls (Fig. 47) than boys, but may be seen in robust boys who practice special exercises. While the deformity often begins in young children, it does not commonly become apparent until a later period (from eight to fifteen years of age), when growth is rapid. The bowing in the upper part of the spine is usually to the right, while the left shoulder is lowered and the left hip is raised as compared with these points on the right side of the body. The condition is best observed by marking a line along the bony projections of the spine down the back (see Fig. 47). There

are frequently no unpleasant symptoms.

Sometimes, however, there are fatigue from slight causes, general irritability and pain in the back or on the left side, if the bowing of the spine is toward the right. More often no pain is produced, and the mother's attention is called to a child by the dressmaker, because the subject has one breast higher than the other, or because of a high or large hip, or high shoulder. Occasionally the disease may closely resemble angular curvature, described above, but fever, pain on movement, and stiffness of the back are absent.

**Treatment.**—In children this deformity of the spine may some-

times be corrected by properly selected exercises or by apparatus. Special knowledge and skill are required for this purpose, so that the physician should be informed as soon as there is any evidence of lateral deformity, and parents should, therefore, be on the lookout for the existence of it.

In order to prevent the condition the general health should be improved. Outdoor games are most useful, as swimming (breast stroke), riding astride, and games not developing muscles on one side of the body—as the side stroke in swimming, playing golf, and the use of side saddle. Diseased tonsils and adenoids cause ill health and should be removed. Great care should be taken to have shoulder straps of clothing hug the neck, as do men's suspenders, and not have the weight of the clothing borne by straps over the outer part of the shoulders. The eyes and ears should be examined, and if errors of vision may be corrected by glasses, or deafness cured by removal of adenoids, these matters should be attended to. Faulty postures should be remedied. A narrow, straight, high-backed chair gives best support to the back. Round shoulders and generally faulty position in standing are considered in connection with the conditions they produce.

### HIP JOINT DISEASE—HIP DISEASE

**Causes.**—The disease of children commonly called hip disease is usually an inflammation of the hip caused by the germ of tuberculosis or consumption.

**Symptoms.**—It begins slowly, occurring often, one to four months after an injury, as a fall or blow. The first symptom which attracts attention to the disease in the child is usually a slight limp and stiffness of the affected limb in the morning, which may pass off later in the day when the child is playing. Sometimes there may be periods of weeks when this disappears, only to return in a worse form. More often, however, it is constantly present and grows worse. Two to six months later pain appears along with the lameness. But the pain at first is not as a rule in the diseased hip joint, but in the toe, calf or



leg, or knee. This is apt naturally to mislead parents into thinking the trouble is due to the misnamed "growing pains," rheumatism, or weakness in the knee, but they must avoid this error. At night the child often cries out in pain.

The position in which the child often holds the affected leg is often characteristic. The weight is chiefly borne on the sound limb, while the diseased limb is bent slightly at the hip, and the toes and the limb are turned outward. At the same time the crease, naturally present under the buttocks, is less noticeable. At the back of the thigh of the affected side the lame leg appears longer than the sound one. Later in the disease the lame leg remains bent but is held closer to the sound foot, and seems shorter than its fellow, and the foot may be turned either outward or inward.

**Treatment.**—If the physician's attention is called to it in the beginning, almost every case can be cured by rest in bed, splints, and apparatus of various kinds. If neglected until a late date abscess about the joint, years of suffering, permanent crippling and lameness, loss of one limb, or even death result.

### BOW-LEG

Most babies appear to be bow-legged at birth, as they have a tendency to bring the soles of their feet together, causing the legs to bow outward. This condition disappears as the baby grows older, although occasionally a child is born really bow-legged. Bow-legs more often develop, however, between the ages of one and six, and are usually due to rickets. The condition may also be seen in robust, heavy children, who have been allowed to walk at too early an age.

**Symptoms.**—In bow-legs the lower limbs are bent outward in most cases, so that the knees are widely separated. The bowing may either be of the two bones of the leg, below the knee (most common), or of the thigh bone as well, above the knee.

About one person in five is said to be bow-legged and while the condition causes no physical disability or discomfort, it is often a repulsive deformity.



**Treatment.**—Children having a tendency to bow-legs should not be permitted either to walk or stand at an early age. The avoidance of thick diapers—which prevent the child from holding its thighs together—is important. Massage, that is, rubbing the legs and kneading the muscles—and making gentle and continued pressure on the outside of the limbs, so as to bend them inward into a straight line, will correct the deformity in infants, if done persistently several times daily.

When bow-legs first develop in babies, treatment directed against rickets is usually desirable: the child must remain outdoors as much as possible; the diet should be improved; one-half to one teaspoonful of an emulsion of cod-liver oil may be given to the child three times daily, and pure cod-liver oil should be rubbed all over the body once daily after the bath. If the soles of the shoes are made thicker along the outer borders it will favor correction of bow-legs, when the child begins to walk. In older children, when bow-legs are very pronounced and the deformity is of long standing, correction can only be secured through the application of apparatus by a surgeon, in patients under three and one-half years, or after that age by operation, such as cutting the bent part of the bones of the thighs and setting them in proper position.



FIG. 48.—Bow-LEGS.

## KNOCK-KNEES

**Causes.**—This is a deformity acquired in infancy, owing to rickets—with malformation of the bones of the legs, either above or below the knees—but may develop in later life, owing to weakness of the ligaments, on the inner side of the knee joint. Prolonged standing, carrying heavy loads, and flat feet, favor knock-knees in older patients.

**Symptoms.**—It may occur in one or both knees. In knock-knee the knees are in close contact, and the feet held apart. A slight degree of this condition is seen naturally in women. Knock-knee is not

recognized by parents so readily as bow-legs. After the child has begun to walk, it may show the trouble by an awkward, waddling gait, by the knees rubbing together, and by frequently stumbling and falling, and the deformity may be seen when the child is standing erect or lying with the legs stretched at full length.

**Treatment.**—The deformity does not tend to correct itself, as in the case of bow-legs. The treatment with cod-liver oil and outdoor life, advised for bow-legs, is appropriate for knock-knee in infancy. Also the legs should be well rubbed, kneaded, and straightened by pressing upon the inside of the knee joints with the palm of the one hand, while the ankle is grasped with the other. Such treatment should be employed for ten minutes at a time twice each day.



FIG. 49.—KNOCK-KNEES.

Children with a separation of two inches or less between the ankles, should wear shoes with soles made one-quarter of an inch thicker on the inner border, and should be encouraged to toe in. They

should be kept off their feet as much as possible, but may ride a bicycle or pony. If such measures do not correct the deformity, it will be necessary for a physician to apply braces, which will usually cure the condition in children under four. After this age an operation to break or cut the bones above the knee may be required to secure a good result.

### WEAK FOOT AND FLAT FOOT

The patient with weak feet stands and walks with the feet well apart and the toes turned out, as in Fig. 50. The foot is rolled inward so that the inner border of the heels and soles of the shoes are worn down. The bony protuberances on the inside of the ankles are more prominent, and the part of the shoes covering them may

show wear from rubbing together, and many wrinkles may be seen running the length of the shoe from heel to toe in persons with weak feet.

On looking at the bared feet in standing, the bulging of the bony prominences on the inside of the ankles will be present, and the inner border of the whole foot may be seen to be pressed close to the floor (flat foot). On viewing weak feet in standing, from behind, it will be observed that the strong cords at the back of the ankles are not directed directly downward, as they should be, but somewhat outward (Fig. 51). If a person stands and walks with feet held apart and toeing out widely, he has weak feet; if in addition the soles are dropped, he has flat feet.

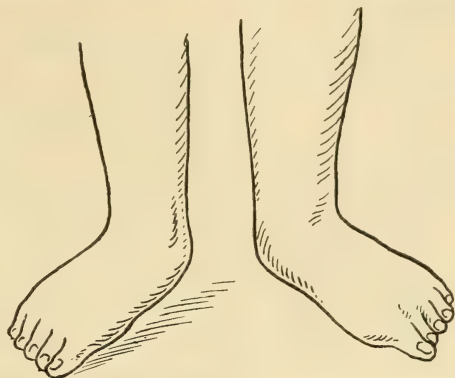


FIG. 50.—WEAK FEET SEEN IN FRONT.

Weak feet are common in children and in adults who are compelled to stand constantly. The wearing of improper shoes is largely the cause of weak feet. Aborigines who go bootless are not troubled with weak feet.

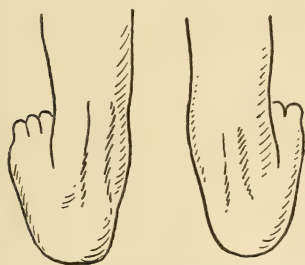


FIG. 51.—WEAK FEET SEEN BEHIND.

The great toe is the great support of the foot and prevents it from rolling inward, as seen in weak feet. In wearing shoes with narrowed toes the great toe is forced in toward the middle line of the foot and its support is greatly lessened, while bunion is apt to result.

When children go barefoot the feet will probably be strong in after years unless they are abused by wearing bad shoes. The custom of allowing young girls to go about constantly in low shoes is provocative of weak feet and ungainly big ankles and, for the latter reason, ought to be more readily prevented by parents.

The proper kind of shoes to wear are described on page 272, but it might be added that the sole of the shoe under the instep should not be too high, so as to fit too snugly under the arch of the foot, as this prevents freedom of movement and weakens the arch, as do metal plates.

Flat feet are an aggravated form of weak feet, although they may arise from other causes, as from infantile paralysis, fracture of the ankle, and from prolonged standing, especially in heavy persons. Flat foot depends usually upon the weakness of the ligaments or muscles of the feet and leg, and as in lateral curvature of the spine, there may be structural changes in the bones of the feet, in severe cases of long duration. Then we have a rigid flat foot, and its position must be altered by great force under ether before it can be otherwise properly treated.



FIG. 52.—A. PRINT OF NORMAL FOOT.  
B. PRINT OF FLAT FOOT.

In flat foot the arch under the instep gives way so that the bottom of the whole foot becomes flat and, in the worst cases, the whole sole of the foot rests on the ground in standing. In marked cases, patients stand and walk with the toes turned out. This is always a sign of foot weakness; toeing in is much to be preferred and this habit should not be interfered with by parents. The correct position for the feet in walking and standing is the straight one—not toeing in or out.

To test for flat feet the subject may stand on smoked paper, or cover the bottom of the feet with bluing and make a print of the soles by standing on wrapping paper.

The prints of the normal and flat foot may be seen in Figure 52, although in moderate flat foot the inner border of the foot may show a lighter pressure on the paper, instead of touching it on the whole under surface as in Figure 52.

**Symptoms.**—Pain and tenderness in the soles of the feet, ankles, under the heel, and in the legs, calves, thighs, and back, in standing or walking, are the chief symptoms in weak or flat feet of adults. In children with weak feet pain is, however, commonly absent. The pain may be so great as to cripple the subject, but as soon as he is off



his feet it quickly abates. Symptoms come on slowly or rapidly in adult life, as in nurses, policemen, stationary engineers and others standing on hard, uncarpeted, or cement floors. After a month or two of such work the symptoms appear.

It is not the most marked degree of flat foot that always gives the most trouble, but often the slighter forms. The pain of flat feet is usually attributed to rheumatism by the patient, and backache due to this cause in women is often referred to "womb trouble."

**Treatment.**—The treatment of weak foot and the milder forms of flat foot is much the same. The patient should learn to stand and walk with feet held straight, not toeing out at all. The old idea that it is proper to toe out in standing or walking is absolutely wrong.

In weak feet certain exercises are of great value although, in the case of children, games in which the child stands on its toes are more practical. Tennis, running, jumping, cycling, and ball are therefore useful. Roller skating is harmful, but dancing is beneficial. The heels and soles of the shoes should be made thicker to the extent of from one-eighth to one-half an inch along the inner borders, and it is a good plan to have the heel lengthened and widened on the inner border (*see* Fig. 53) so as to give more support to the foot.

For adults or older children the following special exercises are advised:

1. Walk on the toes, pointing them inward.
2. Walk on the outer borders of the feet with the toes turned in.
3. Sit with the soles of the feet together resting on the outer borders.
4. Stand with the toes turned in and raise one foot quickly, and come down slowly on the outer border of the foot.

Do this twenty times night and morning with each foot (Taylor).

The use of metal plates for weak foot and flat foot is questionable. In some cases of weak feet in adults, plates may be used. In severe flat feet in adults it has been the custom to keep the patient off his feet for two weeks, to hold the foot in proper position by strapping



FIG. 53.—MODIFIED THOMAS HEEL.

with adhesive plaster, and then to apply proper plates under the arch of the feet, made by securing an impression of the feet in plaster of Paris. Plates do not correct the deformity, but rather increase it by doing away with the normal action of the foot. Sometimes they produce abscess by pressure.

Gradual correction of the feet by strapping with surgeon's plaster and the use of felt pads is best when many months can be given to the treatment. Teaching the patient to stand and walk properly is the final step. The fitting of flat foot plates by the shoe clerk is as much to be deplored, as the fitting of glasses by an optician. The cases of rigid flat foot must submit to forcible correction, as noted above.

But in this place the matter of prevention of weak and flat feet by correct walking, standing, exercises and shoes, is of much greater importance than the details of treatment which properly belong to the orthopedic surgeon.

## CHAPTER VII

### INFECTIOUS DISEASES

Scarlet fever. Measles. German measles. Smallpox. Chicken pox.

An infectious disease is a germ disease—that is a disease due to a germ or living organism. It is a broad term and includes contagious diseases, or those acquired by contact of well persons with the sick.

Among the more common of the strictly speaking contagious diseases, or those we acquire by actual contact with patients suffering from the same, are: measles, scarlet fever, German measles, smallpox, chicken pox, mumps, infantile paralysis and whooping-cough. While some of these may be acquired from the secretions, excretions, clothing, and premises of the sick, yet recent knowledge shows that most people take such diseases from actual contact with individuals harboring the special germs on their persons. Such persons may have recovered and yet carry the germ for months or years, or they may have so mild a form of disease that they do not stay indoors, or they may be those who are still in the convalescent stage.

It is safer to use the term infectious or communicable as applied to a disease which may be communicated from one person to another, since infectious does not imply the means of communication. Thus typhoid fever may be contagious and be acquired by direct contact with the sick, but it is more often acquired by swallowing milk, water, or other food containing typhoid germs. Again, both malaria and yellow fever are infectious diseases but are not communicated by contact with the sick at all, but only through the medium of mosquitoes, and are therefore not contagious.

### THE INFECTIOUS ERUPTIVE FEVERS

These, with the exception of smallpox, attack children more commonly than adults. As they all begin with fever, and the characteristic rash does not appear until one to four days after the beginning of the sickness, the diagnosis of these diseases must always be a matter of doubt at the outset. For this reason it should be the invariable rule to isolate any child with fever, even if the trouble seems to be due to a "cold" or digestive disturbance, in order to avoid possible communication of the disease to other children.

By isolation is meant that a child should stay in a room by himself and the doors should be kept closed, and no children should enter, nor should any object in the room be removed to other parts of the house after its occupation by the patient.

While "cold" and indigestion are among the most frequent ailments of children, they must not be neglected, because measles begins as a bad cold, smallpox like the grippe, and scarlet fever with sore throat, or tonsillitis, and vomiting.

Kindergartens are hotbeds of infection, and it is inadvisable to herd any large number of small children at the age when they are most susceptible to the common contagious diseases and at which the danger is greatest.

The services of a physician are peculiarly demanded in all cases of eruptive diseases in order that an early diagnosis be made and measures be taken to protect the family, neighbors, and community from the disease. The failure of parents or guardians to secure medical aid for children is regarded by the law as criminal neglect, and those responsible are liable to punishment. Health authorities require the reporting of all contagious diseases as soon as their presence is known, and failure to comply with the law renders the offender liable to fine or imprisonment in most places.

#### SCARLET FEVER

There is no difference between scarlet fever and scarlatina. It is a popular mistake to suppose that scarlatina is a mild form of scarlet fever.



Scarlet fever occurs most frequently in children between the ages of two and six years. Ninety per cent. of cases occur in children under ten years of age. Fifty per cent. of children exposed to scarlet fever take the disease, while practically all children exposed to measles acquire it. This remark applies only to those who have not previously had either disease.

A healthy person who has been exposed, as a nurse, can carry the infection to the well by coming directly from the sick. This is not the case in measles. However, this method of conveying the disease is rare, as students have been in the habit of going from scarlet fever wards directly into the general wards for years in a large city hospital without giving the disease to the other patients.

Scarlet fever is almost unknown in infants under one year. It is rare in adults, and one attack usually protects the patient from another. Second attacks have occurred, but many such are more apparent than real, since an error in the diagnosis is not uncommon.

The disease is communicated from the patient at any time after the onset until toward the latter end of the peeling period and even later, if there is any discharge from the nose, throat, or ears. The disease is communicated then by the scales of skin, breath, urine, and discharge from the body. Sores occurring after the disease convey the infection. An epidemic has been recorded which originated from milk contaminated from a sore on the finger of a milkman who had recently recovered from scarlet fever.

While scarlet fever is a germ disease, the special germ causing it has not been discovered. The germs will live in toys, books, letters, clothing, wall paper, etc., for weeks. Close contact with the patient or exposed persons or objects is apparently necessary to acquire the disease.

**Period of Development.**—After exposure to the germs of scarlet fever usually two to five days elapse before the disease becomes manifest. Occasionally the symptoms of the disease occur within twenty-four hours of exposure, and rarely they are delayed a week or ten days. If a person remains well ten days after exposure, he has not been infected. If symptoms occur within two days after exposure, the attack is apt to be very severe.

**Symptoms.**—The onset is usually sudden. It begins with vomiting (in very young children, sometimes with convulsions), sore throat, fever, chilliness, headache. The tongue becomes furred. The patient often becomes stupid or may be restless and delirious. Within twelve to thirty hours or so, the rash appears, first on the lower part of the neck and upper part of the chest, and rapidly spreads over the trunk, and within forty-eight hours covers legs and entire body except the face, which may be only flushed. The rash appears as fine, scarlet pin points scattered over a background of flushed skin and gives to the patient the general appearance of a “boiled lobster,” when at its fullest development at the end of the second or third day. After this time the rash generally fades away and disappears within five to seven days. It is apt to vary greatly in intensity from time to time while it lasts.

As the rash fades, scaling of the skin begins in large flakes and continues from ten days to as many weeks, usually terminating by the end of the sixth to eighth week. One of the notable features is the appearance of the tongue, at first showing red points through a white coat and, after this clears away, in presenting a raspberry-like aspect.

The throat is deep red, and the tonsils may be dotted over with white spots (see Tonsillitis), or covered with a whitish or gray membrane suggesting diphtheria, which occasionally complicates scarlet fever.

The fever is usually high ( $103^{\circ}$  to  $107^{\circ}$  F.), and the pulse ranges from 120 to 150—both declining after the rash is fully developed, generally by the fourth day. The urine is dark and scanty. There is, however, great variation in the symptoms both as to their presence or absence, intensity, and time of occurrence and disappearance. The seventh to fourteenth day is apt to be the most critical period, on account of complications.

**Complications and Sequelae.**—These are frequent, and make scarlet fever the most dreaded of the eruptive diseases, except smallpox.

Enlarged glands under the jaw, and at the sides of the neck, are common, and appear as lumps at these sites; although usually

not serious, they may enlarge in severe cases and threaten life through gangrene, bleeding, and abscess with blood poisoning. Pain and swelling in the joints, especially of the knees and elbows, are not rare and may be the forerunners of serious inflammation of these parts. Pneumonia and pleurisy sometimes occur, and pus may form in the chest. One of the most frequent and serious complications of scarlet fever is inflammation of the kidney, occurring more often toward the end of the second week of the disease.

Examination of the urine by the attending physician at frequent intervals throughout the course of the disorder is essential, although puffiness of the eyelids and face, and of the feet, ankles and hands, together with lessened secretion of urine—which often becomes of a dark and smoky hue—may denote the onset of this complication. The disease of the kidneys usually results in recovery but occasionally in death or in chronic Bright's disease.

Inflammation of the ears with the formation of abscess of the middle ear, discharge of matter from the ears externally, and—as the final outcome—deafness, are with inflammation of the kidney some of the common complications.

The kidney complication may to a considerable degree be prevented by the use of a liquid diet. Also spraying the nose and throat frequently, and wearing a night cap with ear laps, if the room is not warm at night, will aid in preventing the patient from having ear trouble.

Inflammation of the eyelids is an occasional complication. The heart is sometimes attacked by the germs of the disease, and permanent damage to the organ, in the form of valvular trouble, may result. Blindness and nervous disorders are among the rarer sequels, including paralyses and St. Vitus's dance.

**Diagnosis.**—When beginning with vomiting, headache, high fever, and sore throat, and followed in twenty-four hours by a general scarlet rash, the diagnosis is not difficult, but occasionally other diseases, such as indigestion, grippe, and German measles, present rashes.

Measles may be distinguished from scarlet fever in that measles appears first on the face; the rash is patchy or blotchy, and does



not show for three or four days after the beginning of the sickness. The measles patient seems to have a bad cold with fever, cough, running at the nose, and sore eyes. German measles is mild, and, while the rash may resemble that of scarlet fever, the patient does not feel sick and there is rarely catarrh of the nose or eyes.

In no sickness is the skill of a physician more needed than in scarlet fever; first to make the diagnosis, and then to prevent or combat the complications which often approach insidiously.

**Outlook.**—The average death rate of scarlet fever varies between twelve and fifteen per cent. It is very fatal in children about one year old, and most of the deaths occur in those under six. The mortality varies greatly at different times and in different epidemics—as from three to fifty per cent.

**Duration of Contagion.**—The disease is commonly considered contagious as long as peeling lasts, but, as we have seen, any discharge from the nose, throat, or ear is capable also of communicating scarlet fever after other evidences of the disease are past. Scarlet fever patients should always remain in bed three to four weeks, and be isolated from eight to ten weeks, without regard to any shorter duration of peeling.

At the close, the patient should be given a bath in a solution of corrosive sublimate (1 to 2,000) and the hair should be thoroughly washed with soap and water, and then in seventy per cent. alcohol. After this is done the patient may be set free from quarantine.

**Treatment.**—In case a physician is not obtainable the patient must be put to bed in the most airy and sunshiny room, which should be heated to 70° F., and from which all unnecessary movables should be taken before the entrance of the patient. A flannel nightgown and light bed clothing are desirable.

The fever is best combated by cold sponging, which at the same time diminishes the nervous symptoms, such as restlessness and delirium. The body should be sponged, part at a time, with water at a temperature of about 70° F., after placing a compress of a few thicknesses of old cotton or linen, wet with ice or cold water (better an icecap) on the forehead. The part should be thoroughly dried as soon as sponged, and the process repeated whenever the tempera-



ture is over 103° F. There is no need to fear that the patient may catch cold if care is taken to expose only a portion of the body at a time.

It is well that a rubber bag containing ice, or, failing this, a cold cloth, be kept continually on the head while the fever lasts. The throat should be sprayed hourly with Dobell's solution and the nose also three times daily. In young children a one per cent. solution of camphor and menthol in albolene may be dropped in the nostrils, with the head thrown back. A half medicine dropperful should be used in each nostril three times daily in place of the spray just advised. An icebag, or cold cloth frequently wet and covered with oil silk or rubber and flannel, should also be applied to the outside of the throat.

The diet should consist of milk, broths, and thin gruels, and plenty of water should be given to prevent irritation of the kidneys. Cocoa, rice, farina, and milk toast, buttermilk, orangeade and lemonade are also desirable.

A one-half to one per cent. solution of lysol is useful for bathing the skin to relieve irritation. During the peeling the whole body should be bathed daily with Castile soap and warm water and then anointed with carbolized vaselin. The bowels must be kept regular with injections, or by the use of mild cathartics, as aromatic fluid-extract of cascara or syrup of rhubarb—one-half to one teaspoonful or more.

It is imperative for the nurse or mother to wear a cap and gown over the outside clothes, and these should be slipped off at the door of the sickroom, and kept there in a box or bag inside the room to don before entering again. All others except the doctor must be kept out of the sickroom. No outsiders should enter the house and those who have been exposed should keep away from school and other persons until ten days have elapsed. Then those exposed are safe, if not already attacked, and may go to school or elsewhere providing they stay away from the house until it has been fumigated. Of course no pretense has been made to describe the treatment of the various complications as a doctor should always care for the case when one can be secured.

**MEASLES**

Measles is a contagious disease characterized by a preliminary stage of fever, and catarrh of the eyes, nose, and throat, followed by a general eruption on the skin. One attack usually protects a person from another, yet on the other hand second attacks do occur. It is more contagious than scarlet fever, and isolation in a room in a house is of less value in preventing communication to other inmates, whereas in scarlet fever half the number of susceptible children in a house may escape the disease by this precaution.

The germs which cause measles perish very rapidly, and it is said that they live but two hours outside of the body; so that the room, and clothing, or other objects exposed to the patient, require only a thorough airing for a day to be rendered safe. Whereas, in scarlet fever, the danger of the transmission of contagion may lurk in infected clothing and other articles for weeks, unless they are subject to proper disinfection.

A patient with measles is capable of communicating the disease from the outset, before the appearance of the rash, by means of the breath, discharges from the eyes and nose, tears, saliva, and all the secretions. Usually from seven to ten days after the appearance of the rash the patient is incapable of giving the disease to others, but three weeks is none too long to enforce quarantine.

Close contact with a patient is commonly necessary for one to acquire the disease, but apparently it is sometimes carried in the clothes by a nurse or third person. It is frequent in infants under six months, but most frequent between the second and sixth year. Adults are attacked by measles oftener than by scarlet fever.

**Period of Development.**—An interval of from seven to sixteen days elapses after exposure to measles before the disease becomes apparent.

**Symptoms.**—The disease begins like a severe cold in the head with fever. The eyes are red and watery, the nose runs, and the throat is irritable, red, and sore, and there is some cough, chilliness, and muscular soreness. The fever, higher at night, varies from 102° to 104° F., and the pulse ranges from 100 to 120 or more.

There is often marked drowsiness for a day or two before the rash appears. Coated tongue, loss of appetite, occasional vomiting and thirst are present during this period.

The appearance of minute white or bluish-white spots, surrounded by a red area, may often be seen in the inside of the mouth, on a level with the roots or tops of the back teeth, for some days before the skin eruption. This is the measles eruption in the mouth which is always looked for by the doctor as the earliest sign of the disease.

The preliminary period, when the patient appears to be suffering from a bad cold, lasts for four days usually, and on the evening of the fourth day the rash breaks out. It first appears on the face and then spreads to the trunk, chest and limbs. Two days are generally required for the complete development of the rash. It remains in full bloom for about two days more, and then begins to subside, fading completely in another two days—six days in all.

The rash appears as bright red, slightly raised blotches on the face, which is commonly somewhat swollen. The same rash extends to the abdomen, back and limbs. At this time the cough may be hoarse and incessant, and the eyes extremely sensitive to light. The fever and other symptoms abate when the rash subsides and well marked scaling of the skin occurs, although it is much finer and more branlike than in scarlet fever.

**Complications and Sequelae.**—Severe bronchitis, pneumonia, croup, laryngitis, sore eyes, ear abscess and deafness, violent diarrhea, convulsions, and, as a late result, consumption are sometimes sequelae. (For consideration of these disorders, see special articles in other parts of the book.)

**Outlook.**—The vast majority of healthy patients over two years of age recover from measles completely. In children under two years it is a serious disease, and one from which parents should by every means protect their infants. Lung complications are particularly to be feared in infants and in those suffering from other disorders.

The disease is peculiarly fatal in some epidemics occurring among those living in unhealthy surroundings, and in communities unaccustomed to the ravages of measles. Thus, in an epidemic



attacking the Fiji Islanders over one-quarter of the whole population (150,000) died of measles in 1875. The same applies to the Esquimaux and other aboriginal people. Measles is more severe in adults than in children.

**Diagnosis.**—For one not familiar with the characteristic rash a written description of it will not suffice for the certain recognition of the disease, but if the long preliminary period of catarrh and fever, and the appearance of the eruption on the fourth day, be taken into account, together with the existence of inflamed eyes and hoarse, hard cough, the determination of the presence of measles will not be difficult in most cases.

**Treatment.**—The patient should be put to bed in a well ventilated room at a temperature of  $68^{\circ}$  to  $70^{\circ}$  F., if possible. If light is painful to the eyes, as is usually the case, the room should be darkened.

While by isolation of the patient we may often fail to prevent the occurrence of measles in other susceptible persons in the same house—because of the very infectious character of the disease and because it is probable that they have already been exposed during the early stages when measles was not suspected—nevertheless all possible precautions should be promptly adopted. For this reason other children in the house should be kept from school and away from their playfellows. They should, on the other hand, not be sent away from home to perhaps spread the disease elsewhere.

The bowels should be kept open by a daily soapsuds enema, or by mild cathartic as a Seidlitz powder. If fever is over  $103^{\circ}$  F. and is accompanied by much distress and restlessness, children may be sponged with tepid water, and adults with water at  $80^{\circ}$  F. every two hours, or as directed under Scarlet Fever.

When cough is incessant, or the rash does not come out well, there is nothing better than the hot pack. To give this the patient is stripped of all night clothing and wrapped from feet to neck in a blanket wrung out of hot water containing two teaspoonfuls of mustard to the gallon of water. The wet blanket is then covered with two dry blankets and the patient should remain wrapped in these three blankets for two or three hours, when the application



may be repeated if necessary. It is well to keep a cold cloth on the head during the process.

Cough is also relieved by a mixture containing syrup of ipecac, twenty drops; paregoric one teaspoonful, for an adult (or one-third the dose for a child of six). This should be given in one-quarter glass of water and may be repeated every two hours if necessary.

If there is hoarseness, the neck should be rubbed with a mixture of sweet oil, two parts; oil of turpentine, one part; and covered with a flannel bandage.

A solution of boric acid (ten grains of boric acid in one ounce of water) is to be dropped in each eye every two hours. Although usually mild, the eye symptoms may be very severe and require special treatment by an oculist, and considerably impaired vision may even result.

It is well also to drop a solution of menthol and camphor, each thirty grains, in one ounce of albolene, in each nostril three times daily. A half medicine dropperful should be injected into each nostril, with the head held well back.

Severe diarrhea is combated with bismuth subcarbonate, one-quarter teaspoonful, every three hours. For adults the diet consists of milk, broths, gruels, eggs—raw, boiled soft or scrambled—and toast. Infants on a milk diet should receive the mixture to which they are accustomed, diluted with an equal part of barley water. Nourishment may be given every two hours, except during sleep.

The patient should remain in bed ten days, and should stay in his room three days after getting up, and after leaving his room should stay in the house a week later. This allows a period of three weeks "laying up" for an attack of measles. If there are other susceptible persons in the house it is wiser for the patient to stay in his room the whole of this time.

The principal danger following an attack of measles is of pneumonia or tuberculosis (consumption), if there is exposure to wet, or cold draughts.

## GERMAN MEASLES

*(Rubella)*

German measles is related neither to measles nor to scarlet fever, although it has received its name because it was thought to combine the sore throat of scarlet fever with the rash of measles. It is a distinct disease, and persons who have had both measles and scarlet fever are still susceptible to rubella.

One attack of the disease usually protects the patient from another. Adults are almost as liable to German measles as children, but it is rare in infants. It is very contagious and often occurs in widespread epidemics. The breath and emanations from the skin apparently transmit the disease—from the appearance of the first symptom to the disappearance of the eruption.

**Period of Development.**—The period after exposure to German measles until the beginning of the disease varies greatly—usually about two weeks, but possibly from five to twenty-one days.

**Symptoms.**—The rash may be the first sign of the disease and frequently is, in children. In others, for a day or two preceding the eruption, there may be headache, soreness and redness of the throat, the occurrence of red spots on the roof of the back of the mouth, chilliness, soreness of the muscles, loss of appetite, and watering of the eyes. The marked inflammation of the eyes and running from the nose seen in true measles are absent.

The preliminary symptoms are much milder and shorter in duration than in measles, where they last for four days before the rash appears; the hard persistent cough of measles is absent in German measles. Also, while there is sore throat in German measles, there is not the severe form with swollen tonsils covered with white spots, so often seen in scarlet fever. Fever is sometimes wholly absent in German measles; usually it ranges about 100° F., rarely is it over 102° F.

Thus German measles differs markedly from both scarlet fever and true measles. The rash usually appears first on the face, then on the chest, and finally covers the whole body, in the space of a few hours—twenty-four hours at most. (Before the eruption is

seen on the skin it may be found on the back of the roof of the mouth and throat.) The rash is greatest on the upper part of the body. The eruption takes the form of rose-red, round or oval, slightly raised spots, from the size of a pinhead to that of a pea, and sometimes running together into uniform redness—as in scarlet fever.

The rash remains fully developed for about two days, and often changes into a coppery hue as it gradually fades away. There are often lumps—enlarged glands—to be felt under the jaw, and on the sides and back of the neck which occur more often than in true measles. The lumps in the back of the neck just at the lower margin of the hair, are the most characteristic. They are found in two-thirds of the cases.

**Diagnosis.**—The diagnosis, in the absence of a physician, must be made on general symptoms, rather than on the rash which requires great experience for its recognition, as it is subject to wide variation in appearance, now simulating measles and again scarlet fever.

German measles differs from true measles in the following points: the first symptoms before the rash are mild, short, or absent, and the cold in the nose and eyes as well as the cough are absent, or slight, as compared with these symptoms in true measles. The lumps in the neck in German measles are more pronounced than they are in true measles.

The onset in German measles is not sudden, as in scarlet fever, where it is accompanied with vomiting; while the sore throat and fever are much milder in German measles. The peeling, so prominent in scarlet fever with the subsidence of the rash, may be present or absent in German measles. If present, the peeling is much finer than in scarlet fever or true measles.

**Outlook.**—Recovery from German measles is the rule and usually without complication or delay. Very rarely have Bright's disease, joint inflammation, pneumonia, jaundice and diarrhea been complications.

**Treatment.**—Little or no treatment is required. The patient should remain in bed in a darkened room, on a light diet, while



the fever lasts, and be isolated indoors from others until all signs of the eruption have passed.

The eyes should be treated with boric acid as in measles; the diet during the fever may consist of milk, eggs—soft boiled, and dropped—and eggnog; broths, thin cereals, and beef juice, for adults or children, while bottle-fed infants should have their milk diluted one-half with barley water.

A bath and fresh clothing for the patient, and thorough cleaning and airing of the sickroom and clothing, are usually sufficient without chemical disinfection, after the passing of the disease.

### SMALLPOX

Smallpox is one of the most contagious diseases known. Only one person in a hundred is immune unless protected by a previous attack of the disease or by vaccination. One is absolutely safe from smallpox if recently and successfully vaccinated, and thus has one of the oldest and most frightful and fatal scourges (one-half million deaths a year in Europe before vaccination) of mankind been robbed of its dangers.

The contagium is probably chiefly derived from the scales and particles of skin of the patient after eruption, but the disease has been conveyed by grafting the skin of a patient on a normal person before the eruption appeared, so that smallpox may be contagious after the symptoms have begun but before the eruption appears. The special germ causing smallpox has not been isolated. It is not necessary to come into direct contact with a patient to contract the disease; it may be transmitted some little distance in the air and possibly outside of the sickroom. Careful study appears to show that smallpox hospitals do not threaten the public through the air, but only through persons entering and leaving them. Smallpox may be conveyed by a healthy third person, who has come in contact with the sick, or by the excretions, clothing, and surroundings of patients. The contagium lingers long in the sickroom.

One attack almost invariably protects against another. All ages are liable to smallpox, and it is particularly fatal in children under ten, so that vaccination in infancy is of vital importance.



**Development.**—An interval of ten or twelve days usually elapses after exposure to smallpox before the appearance of the first symptoms. This period may vary from five to twenty days.

**Symptoms.**—There is a preliminary period of three days after the beginning of the disease before the eruption appears. If the onset is mild, then the severer forms are not probable. Smallpox begins suddenly with symptoms which simulate severe gripe—for which the disease is often taken at this time. The patient is seized with a chill, severe pains in the head, back and limbs, loss of appetite and dizziness on sitting up and high fever— $103^{\circ}$  to  $105^{\circ}$  F. The chills may be often repeated and in young children convulsions may take their place.

A fleeting rash on the lower part of the belly, sides of the chest, thighs, and armpits may appear on the first or second day. It may resemble scarlet fever or measles, or take various forms, and is seen only in ten to sixteen per cent. of cases, and rapidly disappears. Delirium may be present when the fever is high and the face is flushed. The symptoms in mild cases may disappear after two or three days and the patient may even go out before, or as the eruption appears.

The true eruption usually occurs on the fourth day and is descending, i.e., beginning on the first day on the forehead and face and on the front of the forearms; it is seen the next day on the body, and then on the front of the legs. Of course this progress is not followed uniformly, but this is the tendency.

The eruption takes four forms successively: first as red spots, like flea bites, near the hair on the forehead and face, soon becoming red, hard, shotlike pimples. Then on the second or third day of the eruption these pimples become tipped with little blisters with depressed centers. Three days later the blisters become filled with matter or pus and are surrounded by a red area, and the skin is drawn tight and swollen.

The eruption is now at its height. The red areas run together, the swelling of the face gives rise to pain and distortion of the features so that the eyelids are swollen and closed, and the patient becomes frightfully disfigured and well-nigh unrecognizable in

severe cases. Fever, which was absent or slight at the beginning of the eruption, now reappears and may mount again to  $103^{\circ}$  to  $105^{\circ}$  F. and then it gradually falls in convalescence. Delirium is common at this time, and patients need constant watching to prevent their escape from bed. A peculiar disagreeable odor is exhaled from the skin.

The eruption now takes the appearance of roundish, yellow-gray pustules, the change beginning on the face, and following the same order as the breaking out of the eruption. These pustules begin to dry after a few days and matter exudes and forms large, yellowish or brownish crusts, about the tenth or eleventh day of the disease, which after a week or so leave red marks, and in severe cases there is pitting. The eruption is usually most marked on the face, hands, and forearms, and least on the belly, and groin and legs, but may be plentiful on the upper part of the back and neck.

In the severe or confluent form the separate eruptive points run together so that face and hands present one distorted mass of abscess formation, swelling and crusting. In these pitting invariably follows, while in those in which the eruption remains distinct, pitting is not certain to ensue. The danger depends upon the number of pustules on the face.

A more serious form is that styled "black smallpox," in which the skin becomes of a dark purplish hue, from the fact that each pustule is a small blood blister, and bleeding occurs, from the nose, mouth, bowels, kidneys, womb, etc. These cases are, almost without exception, fatal in five or six days. The following is a summary of the order of progress in the ordinary form of smallpox.

Period of development:—10 to 12 days from time of exposure.

Period of invasion with high fever, subsiding at the beginning of rash:—3 days' duration.

Eruption of red spots and pimples:—3 days' duration

Eruption of blisters:—2 days' duration

} slight fever.

Matter forming in eruption with high fever:—3 days' duration.

Drying and crusting to time of falling of same with disappearance of fever:—7 days' duration.

This makes 19 days in all.

During the last decade the outbreaks of smallpox have commonly been very mild and have not followed the course just noted. There may be severe headache, backache, fever ( $103^{\circ}$  F.) and vomiting at the beginning, with an eruption of perhaps only a dozen or so of pimples on the face and hands on the third or fourth day. After the first few days the fever and all the disagreeable symptoms may subside and the patient feel perfectly well. Even when the eruption is plentiful it may not go on to formation of matter, but after five or six days the blisters may become dry and hard or wartlike, and disappear.

Although the death rate has been exceedingly low of late it is perfectly possible for a person to contract the most severe form of smallpox from one of these mild and often unrecognized cases—this unfortunately has happened.

Varioloid is a milder form of smallpox which occurs in persons who have been vaccinated. It is similar to the cases just described, and although the headache, backache, fever, and vomiting may be sudden and severe, the fever and other symptoms abate on the appearance of the eruption, chiefly on the face and hands. The rash goes through its phases in about half the usual time without any secondary fever (with the formation of pustules), and without scarring. Occasionally cases of mild smallpox have occurred with the appearance of eruption without any preliminary fever, headache, backache, or vomiting.

**Diagnosis.**—The milder forms of smallpox are most often mistaken for chickenpox, but the preliminary three days of fever, headache, backache, and vomiting do not occur in chickenpox. In the latter there may, however, be a period of twenty-four hours in which such symptoms occur, but milder. In chickenpox the eruption is particularly seen on the back and chest. An outbreak of a contagious pustular eruption in adults would suggest smallpox since chickenpox is a disease of children. If a patient with suspected smallpox had been recently and successfully vaccinated the diagnosis would be certainly doubtful.

Smallpox is very rare in those who have already had the disease or have been successfully vaccinated within a few years. The pre-



liminary three-day period of fever, headache, backache, and vomiting must guide the layman rather than the peculiar appearances of the eruption which requires educated skill and experience to recognize.

This long period of sickness before the appearance of the rash is seen in only one other contagious, eruptive disease—measles. But in measles the marked catarrh of the eyes and nose and the rising fever with the coming out of the rash are characteristic. In smallpox the fever falls as the rash appears and the sore eyes and running nose are not pronounced.

The mild type of smallpox should be treated just as rigidly as severe cases with regard to isolation and quarantine, being more dangerous to the community because lightly judged.

**Outlook.**—During the last decade smallpox has been very mild in the United States. In some 54,000 cases in 1909 to 1910, the death rate was about one per cent. The United States Public Health service stated in their report (Jan., 1915) that the death rate was only about one in 500 cases of smallpox in this country. Some authorities believe that vaccination for generations has established a partial immunity in the race, but this is mere hypothesis.

It has been said that we have a new disease; but such a statement is neither new nor true. In the history of the disease great variability in the virulence of smallpox has been often noted. There have been virulent outbreaks in places only recently.

The death rate in varioloid is about the same as in recent mild smallpox (1.3 per cent.).

Smallpox occurring within five years of a successful vaccination is rarely fatal. The disease has been fatal in eight per cent. of those vaccinated once, and in four per cent. of those vaccinated twice. In former epidemics of smallpox about one-half the patients unprotected by previous vaccinations have died.

**Complications.**—Complications are not the rule even in severe smallpox. Inflammation of the eyelids is, however, frequent and also boils, in the later stages. Delirium, convulsions, and diarrhea are common in children but may be regarded as almost natural symptoms in them.

Among the rarer complications are: laryngitis, pneumonia, in-



sanity, disease of the heart, paralysis, various skin eruptions, inflammation of the joints, eyes and ears, and baldness.

**Prevention.**—This is of chief importance. Vaccination marked an era in medicine when Jenner gave his discovery to the world, in 1796, and when it was introduced into this country in 1800 by Prof. Waterhouse of Harvard. It has hitherto stood alone as the single example of a means of positive protection in a contagious disease but it now has a rival in vaccination against typhoid fever.

Vaccination against smallpox consists in the inoculation of a human being with matter taken from one of the eruptive points on the body of a calf suffering from cowpox. Whether cowpox is a modified form of smallpox or a distinct disease is unknown.

The period of protection afforded by vaccination is uncertain, because it varies with different individuals. In a general way immunity for four or five years is thus secured; ten or twelve years after vaccination the protection is certainly lost, and smallpox may then be acquired.

Every person should be vaccinated between the second and third month after birth, and again between the ages of ten and twelve, and at other times when an epidemic threatens. An unvaccinated person should be vaccinated and revaccinated, until the result is successful, as immunity to vaccination in an unvaccinated individual is one of the rarities in medicine. When unsuccessful, the vaccine matter or technic is faulty.

A person constantly exposed to smallpox should be vaccinated every few weeks—if unsuccessful no harm or discomfort follow; if successful it proves liability to smallpox. In a person previously successfully vaccinated, the vaccination may “take” again any time after four or five years, and, in event of possible exposure to smallpox, he should be revaccinated several times within a few weeks—if the vaccination does not take—before the attempt is given up.

An unvaccinated person, who has been exposed to smallpox, may often escape the disease if successfully vaccinated within three days of the date of exposure, but is not sure to do so.

Diseases are not introduced with vaccine matter, as formerly

occurred when matter was taken from human beings. Most of the inflammation of the vaccinated parts may be avoided by cleanliness in vaccinating and proper care of the wound afterwards.

It is an extraordinary fact that many persons of some intelligence to-day refuse to acknowledge the wonderful preventive effect of vaccination and fear its immediate action as likely to lead to some mysterious permanent damage. There were only two deaths (from erysipelas) in two and one-half million vaccinations in Germany. These could probably have been prevented by cleanliness.

In the absence of a physician vaccination may be properly done by an intelligent person when the circumstances demand it. Vaccination is usually performed in the depression on the outside of the left arm a few inches below the shoulder. If done on the leg the vaccination is apt to be much more troublesome and may confine the patient to bed.

The arm should be thoroughly washed with soap and water, from shoulder to elbow, and then with alcohol diluted one-third with water. When the alcohol is evaporated, and the arm is wholly dry, the ivory point containing the vaccine matter is withdrawn from its case and the skin is scratched over an area about one-third of an inch square. The object is not to draw blood out but to remove the outer layer of the skin, so that it appears red and moist but does not bleed much. This is accomplished by light scratching in various directions. If there is much bleeding the vaccine matter is washed away.

Then the vaccine matter (in glycerin on the end of the ivory point) is gently rubbed into the scratches with the flat surface of the point. These are the most convenient points. If the vaccine matter is contained in small glass tubes, the scratching is done with a cold needle which has been previously heated red hot over a flame. The needle must not touch anything thereafter until the skin is scratched with it. The heating is done to sterilize the needle. After this both ends are broken from the glass tubes and the vaccine matter is squirted on the raw place on the arm (with the rubber bulbs for the purpose), and rubbed in gently by means of the side of the needle point. Sometimes the vaccine matter is supplied dry on

ivory points when they are dipped into water which has been boiled and cooled, and rubbed thoroughly over the raw area.

It is safer to make a second vaccination at the same time, an inch or two below the first, to increase the chance of taking.

The arm must remain bare and the vaccination mark untouched, after the vaccine matter has been rubbed in, until the surface of the raw spot is perfectly dry; this may take half an hour. Then a half dozen layers of sterilized surgical gauze, reaching halfway about the arm for an inch or two above and below the vaccination marks, should be kept in place by strips of adhesive plaster for at least three days, or an absolutely clean handkerchief may be bound about the arm, and folded over the vaccination and kept in place by sewing or by pinning with safety pins. The protection is intended to keep germs from being rubbed into the wound.

After three days the covering may be removed and soft, clean, old cotton or linen should be daily pinned inside the sleeve of the undergarment to come in contact with the vaccination. If the scab is knocked off and an open sore results, it should be treated like any wound by antiseptic powders (as boric acid) and should be covered with sterile gauze.

If the vaccination "takes" it passes through several phases. On the third day following the vaccination a red pimple forms at the point of introduction of the matter, and this is surrounded by a red zone. Some little fever may occur. On the fifth day the pimple has become capped with a blister having a depressed center and containing a clear fluid, and there is a certain amount of hard swelling, itchiness, and pain in the surrounding parts. A sore lump (swollen gland) is often felt in the armpit.

The full development is reached on the eighth day when the pimple (or truly a pustule) is full and rounded, contains matter or pus, and is surrounded by a large area of redness. From the eleventh day the vaccination sore dries, and a brown scab forms over it at about the end of the second week, and the redness and swelling gradually depart. At the end of the third week the scab drops off, leaving a pitted scar or mark. It will be seen that the changes are identical with those described in smallpox.



Not infrequently the vaccination results in a very slight pimple and redness in a week or ten days, in which case the vaccination should be repeated, as this is a kind of abortive form.

Unless the course of a vaccination follows very closely that described it cannot be regarded as successful, although after the first one or two vaccinations the result is often not so severe, and the time of completion of the various stages may be somewhat shortened. In rare cases an eruption, resembling that at the site of vaccination, appears on the vaccinated limb or becomes general on the body, due to inoculation by scratching, or hives may be present.

**Treatment.**—The special treatment of smallpox is largely a matter of careful nursing. A physician or nurse can scarcely lay claim to any considerable degree of heroism in caring for smallpox patients (notwithstanding frequent, foolish newspaper reports) as there is not the slightest danger of contracting the disease provided one has been recently and successfully vaccinated.

The patient should be quarantined in an isolated building, and all unnecessary articles should first be removed from the sickroom, in the way of carpets, curtains, and other such furnishings. It is well that the room be darkened to save the eyes. The diet should be liquid—of milk, broth, and gruels.

Sponging throughout the course of the disease is essential; first with cool water (as directed for scarlet fever) to relieve the fever and itching, while cold should be also applied to the head to prevent delirium and headache. The cold pack is still more efficient. To apply this, the patient should be wrapped in a sheet wrung out of water at a temperature between 68° and 75° F. The sheet should surround the naked body from neck to feet, and should be tucked between the legs and between the arms and body. The whole is then covered with a dry blanket, and a cold, wet cloth or icebag is placed upon the head. The patient may be permitted to remain in the pack for an hour, when it may be renewed if necessary to allay fever or restlessness; otherwise it may be discontinued. The cold sponging or cold pack is advised when the temperature is over 102.5° F., and when with fever there is restlessness and delirium.

Great cleanliness is important throughout the disease; the bed-



clothes should be changed daily and the patient sponged two or three times daily with warm water, when there is no fever. Cloths wet with corrosive sublimate solution (1 part in 5,000 of water) should be kept continuously on the face and hands. Holes should be cut in the face mask for the eyes, nose and mouth, and the whole covered with a similar mask of oil silk to keep the moisture in. Such applications give much relief, and to some extent prevent pitting. The hair must be cut short and crusts on the scalp treated with frequent sponging and carbolized vaselin to soften them and hasten their falling. Boric acid solution should be applied frequently to the eyes, as recommended in measles, and the throat sprayed every few hours with Dobell's solution.

Diarrhea in adults may be checked with teaspoonful doses of paregoric<sup>1</sup> given in water hourly. Vaseline and cloths used on one patient must not be employed upon another, as boils are readily thus propagated. Each patient should have a special tube of vaselin. All clothing, dishes, glasses, knives, forks and spoons, etc., coming in contact with a patient must be either boiled ten minutes, or soaked in a three per cent. solution of carbolic acid for twenty-four hours, or burned.

When the patient is wholly free from scabs, after bathing and putting on disinfected or new clothes outside the sickroom, he is fit to reënter the world.

### CHICKENPOX

(*Varicella*)

Chickenpox is a contagious disease, chiefly attacking children. While it resembles smallpox in some respects, at times simulating the disease so closely as to puzzle physicians, it is a distinct disease and in no way related to smallpox. This is shown by the fact that chickenpox sometimes attacks a patient suffering with, or recovering from, smallpox. Neither does vaccination or a previous attack of smallpox protect an individual from chickenpox.

Chickenpox is not common in adults, and its apparent presence

<sup>1</sup> Paregoric is a preparation of opium, and may only be bought on a doctor's prescription.

in a grown person should awaken the liveliest suspicion that the case be one of smallpox, since this mistake has been frequently made, and with disastrous results, during an epidemic of mild smallpox.

One attack of chickenpox usually protects against another, but two or three attacks in the same individual are not unknown.

The disease is capable of transmission from the patient to another person from the time of the first symptom to the disappearance of the eruption. The disease ordinarily occurs in epidemics, but occasionally in isolated cases.

**Period of Development.**—An interval of two weeks commonly elapses after exposure to the disease before the occurrence of the first symptom of chickenpox; but this period may vary from thirteen to twenty-one days.

**Symptoms.**—The characteristic eruption may appear without general symptoms. More commonly there is some fever ( $99^{\circ}$  to  $102^{\circ}$  F.) and perhaps a slight chill, pains in the back and legs, and vomiting, lasting for twenty-four hours before the eruption is seen. Rarely there may be high fever, convulsions, delirium, sore throat, and a general redness of the skin during this twenty-four hour period preceding the eruption.

The eruption is first seen on the back or chest, in most cases, but in some it occurs first on the face, temples, and forehead. It consists of small red pimples which rapidly develop into pearly looking blisters about as large as a small pea, and rarely as large as a finger nail, and are sometimes surrounded by a red blush on the skin.

The change from the red pimple into the blister form takes but a few hours. These blisters vary in number from a dozen or so to several hundred. They do not run together, and in three or four days dry up, become shriveled, puckered, covered with a dark brown or blackish crust, and drop off, leaving only temporary red spots in most cases. If the child scratches much, however, sores may form and leave bad scars on the skin.

Occasionally the eruption comes out in the mouth, on the lips, tongue, nose, ear and foreskin in males, and about the sexual organs

in females. In the mouth the eruption presents the appearance of white spots surrounded by a deeper red area. Fever is irregular and does not abate with the appearance of the eruption.

During the first few days successive crops of fresh red spots surmounted by blisters are seen, so that while the first crop is drying up the second may be in full development. This forms one of the distinguishing features of chickenpox as compared with smallpox in which the eruption does not appear in successive crops. In chickenpox the eruption is more often on the part of the skin which is covered, while in smallpox the eruption is more often first seen on the face and hands. Still in some cases the eruption in chickenpox is seen on the scalp and forehead, palms, soles and forearms, and on the inside of the cheek and roof of the mouth.

The blisters are rarely filled with matter or pus, as in smallpox, unless they are scratched, and this should be guarded against—especially on the face, to prevent the formation of scars.

**Diagnosis.**—The diagnosis between chickenpox and smallpox is sometimes puzzling and demands the skill of an experienced physician. When one is unavailable the following points may serve to distinguish the two diseases:—

Smallpox usually begins like a severe attack of grippe with pain in the back and head and generally about the body, with nausea, vomiting, high fever ( $103^{\circ}$  to  $104^{\circ}$  F.). These symptoms last two or three days and may completely subside before the rash appears. In chickenpox this preliminary sickness is absent, or does not begin until twenty-four hours before the eruption appears. The eruption of smallpox usually occurs first on the forehead, near the hair, or on the wrists, palms of the hands or soles of the feet, and on the arms and legs, but sparsely on the body. The eruption does not appear in successive crops in smallpox. Chickenpox is more often a disease of childhood; smallpox attacks persons of all ages. The crusts in chickenpox are thin and appear in four or five days, while those of smallpox are large and yellow, and occur after eight or ten days. It must be kept in mind, however, that chickenpox in adults is much more severe than in children and the rash more widespread.

**Outlook.**—Chickenpox almost invariably results in a rapid recovery without complications or sequels. Young patients often feel well throughout the course of the disease, which lasts from eight to twelve days.

Rarely inflammation of the kidneys occurs three to fourteen days after the disappearance of the rash, and pneumonia, lumps in the back of the neck or swollen glands, and many other complications have occasionally been seen.

**Treatment.**—Children should be kept in bed until the eruption has reached the crust stage. To prevent scratching the skin may be bathed with a solution of baking soda and tepid water (one teaspoonful to the pint) and then covered with carbolized vaselin. The diet should consist of milk, broths, thin cereals, soft boiled or dropped eggs, and toast.

Patients should be kept in the house until all signs of the eruption are passed, and then receive a good bath and fresh clothing before mingling with others. The sickroom should be thoroughly cleaned and aired, although chemical disinfection is not essential. The services of a physician are always desirable in order that it may be positively determined that the disease is not a mild form of smallpox.



## CHAPTER VIII

### INFECTIOUS DISEASES (*Continued*)

Mumps. Whooping-cough. Typhoid fever. Epidemic cerebrospinal meningitis.

#### MUMPS

Mumps is a contagious disease characterized by inflammation of the parotid glands—situated below and in front of the ears—and sometimes of the other salivary glands below the jaw, and rarely of the testicles in males and the breasts of females.

Swelling and inflammation of the parotid gland may occur from injury; it may also occur as a complication of other diseases, such as scarlet fever, typhoid fever, etc. However, such conditions are wholly distinct from the disease under discussion.

Mumps is more or less constantly prevalent in most large cities, more often in the spring and fall, and is often epidemic, attacking ninety per cent. of young persons who have not previously had the disease. It is more common in males, affecting children and youths, but rarely infants or those past middle age. One attack usually protects against another.

**Development.**—A period from two to three weeks elapses, after exposure to the disease, before the first signs develop. The germ has not yet been discovered, and the means of communication are unknown. The breath has been thought to spread the germs of the disease, and mumps can be conveyed from the sick to the well, by nurses and others who themselves escape.

**Symptoms.**—Sometimes there is some preliminary discomfort before the apparent onset. Thus, in children restlessness, peevishness, languor, nausea, loss of appetite, chilliness, fever, and convulsions may usher in an attack.

Mumps begins with pain and swelling below the ear on one side. Within forty-eight hours a large, firm, sensitive lump forms under the ear, pushing up the lobe, and extending forward on the face, and downward and backward in the neck. The swelling is not generally very painful but gives a feeling of tightness, and disfigures the patient. It makes speaking and swallowing difficult; the patient refuses food, and talks in a husky voice; chewing causes severe pain. After a period of two or four days the other gland usually becomes similarly inflamed, but occasionally only one gland is attacked.

There is always fever from the beginning. At first the temperature is about  $101^{\circ}$  F., rarely much higher than  $103^{\circ}$  or  $104^{\circ}$ . The fever continues four or five days and then gradually declines. The swelling reaches its height in from two to five days, and then after forty-eight hours, slowly subsides, and disappears entirely within ten to fourteen days. The patient may communicate the disease for ten days after the fever is past, and needs to be isolated for that period.

Earache and noises in the ear frequently accompany mumps, and rarely abscess of the ear and deafness result. The most common complication occurs in males past puberty, when during recovery or a week or ten days later, one or both testicles become painful and swollen, and this continues for as long a time as the original mumps. Less often the breasts and sexual organs of females are similarly affected.

**Complications and Sequelae.**—Recovery without mishap is the usual result in mumps, with the exception of involvement of the testicles. Rarely there are high fever, delirium, and great prostration. Sometimes after inflammation of both testicles in the young the organs cease to develop, and remain so, but sexual vigor is usually retained. Occasionally abscess and gangrene of the inflamed parotid gland occur. Recurring swelling and inflammation of the gland may take place, and permanent swelling and hardness remain. Meningitis, nervous and joint complications are among the rarer sequelae.

**Treatment.**—The patient should remain in bed while the fever lasts. A liquid diet is advisable during this time. Fever may be allayed by frequent sponging of the naked body with tepid water.

High fever and delirium demand the constant use, on the head, of the icecap (a rubber bag, made to fit the head, containing ice).

The relief of pain in the swollen gland is secured by the frequent application of a thick layer of sheet cotton, large enough to cover the whole side of the neck, wrung out of hot water and covered with oil silk or rubber sheeting; this is kept in place by a bandage.

Paregoric may be given for the same purpose—a tablespoonful for adults; a teaspoonful for a child of eight or ten—well diluted with water, and not repeated inside of two hours, and not then unless the pain continues unabated.

Inflammation of the testicles demands rest in bed, elevation of the testicle on a pillow after wrapping it in a thick layer of absorbent cotton, or applying hot compresses, as recommended for the neck. After the first few days of this treatment, a suspensory bandage should be adjusted, which can be procured at any apothecary shop, and the following ointment should be applied daily: guaiacol, sixty grains; lard, one-half an ounce on a cotton cloth over the swollen testicle.

The application of a suspensory bandage at the onset of mumps may prevent swelling of the testicles.

### WHOOPING-COUGH

\* Whooping-cough is a contagious disease characterized by fits of coughing, during which a whooping or crowing sound is made following a long drawn breath.

Whooping-cough is generally taken through direct contact with the sick, rarely through exposure to the sickroom, or to persons or clothing used by the sick. The germ which causes the disease exists in the mucus of the nose and throat. Whooping-cough is usually more or less prevalent in all thickly settled civilized communities, at times is epidemic, and often follows epidemics of measles.

It occurs chiefly in children from six months to six years of age. Girls and all weak and delicate subjects are slightly more susceptible to the disease. Some children are naturally immune to whooping-cough. One attack usually protects against another.

**Development.**—A variable period elapses between the time of

exposure to whooping-cough and the appearance of the first symptoms. This may be from two days to two weeks, usually seven to ten days.

**Symptoms.**—Whooping-cough begins like an ordinary cold in the head, with a cough which grows worse at night, and which persists. The coughing fits increase, and the child gets red in the face, has difficulty in getting his breath during these spells and sometimes vomits when the attack is over. After a variable period—from a few days to two weeks from the beginning of the cough—the peculiar feature of the disease appears. The child coughs fifteen or twenty times, without drawing breath, the face swells and grows blue, the eyeballs protrude, the veins stand out, and the patient appears to be suffocating, when at last he draws in a long breath with a crowing or whooping sound, which gives rise to the name of the disease.

Several such fits of coughing may follow one another and are often succeeded by vomiting and the expulsion of a large amount of phlegm or mucus, which is sometimes streaked with blood. In mild cases there may be six to twelve attacks in twenty-four hours; in severe cases from forty to eighty. The attacks last from a few seconds to one or two minutes. Occasionally the whoop comes before the coughing fit, and sometimes there may be no whoop at all, only fits of coughing with vomiting. Between the attacks, puffiness of the face and eyes and blueness of the tongue persist.

The coughing fits and whooping usually last from three to six weeks, but the duration of the disease is very variable. Occasionally it lasts many months, especially when it occurs in winter. The contagiousness of whooping-cough continues about two months, or ceases before that time with the cessation of the cough. Oftentimes there may be occasional whooping for months; or, after ceasing altogether for some days, it may begin again. In neither of these conditions is the disease considered still contagious after two months. When an attack of whooping is coming on, the child often seems to have some warning, as he appears terrified and suddenly sits up in bed, or, if playing, grasps hold of something, or runs to his mother or nurse. Coughing fits are favored by emotion or excitement, by crying, singing, eating, drinking, sudden change of temperature, and by bad air.



**Complications and Sequelae.**—These are many and make whooping-cough a critical disease for very young children. Bronchitis and pneumonia often complicate whooping-cough in the winter, and diarrhea frequently occurs with it in summer. Convulsions not infrequently follow the coughing fits in infants, and, owing to the amount of blood forced to the head during the attacks, nosebleed and dark spots on the forehead and surface of the eyes appear from the breaking of small blood vessels in these places. Severe vomiting and diarrhea occasionally aggravate the case, and pleurisy and consumption may occur.

The violent coughing may permanently damage the heart. Rupture of the lung tissue happens from the same cause, and paralysis sometimes follows the breaking of a blood vessel in the brain. But in the vast majority of cases in children over two years old no dangerous sequelae need be feared.

**Outlook.**—Owing to the numerous complications, whooping-cough must be looked upon as a very serious disease, especially in infants under two years, and in weak delicate children. It causes more deaths than scarlet fever or measles, ranking fourth as a cause of death in children (1902 census), the death rate varying from three to fifteen per cent. (27 per cent. during the first year) at different times and under different circumstances. For this reason it is of importance that a physician's services should be secured when possible.

**Treatment.**—A host of remedies are used for whooping-cough, but no single one is at all times the one to be relied upon. It is often necessary to try different medicines until the one which excels is found.

Fresh air is of greatest importance. Patients should be strictly isolated in rooms by themselves, and it is wise to send away children who have not been exposed. Morally, parents are criminally negligent who allow children with whooping-cough to associate with healthy children. If the coughing fits are severe or there is fever, children should be kept in bed. Usually there is not much fever; perhaps an elevation of a degree or two at first, and at times during the disease. Otherwise children may be outdoors in warm weather,

and in winter on warm quiet days. Sea air is especially good for them.

It is best that the sick should have two rooms, going from one to the other, so that the windows in the room last occupied may be opened and the room well ventilated. Fresh air at night is especially needful, and the patient should sleep in a room which has been freshly aired. The temperature should be kept at an even 70° F., and the child should not be exposed to draughts. Vaporizing antiseptics have been widely used, especially vapocresolin and carbolic acid. It is the opinion of the best medical men that pure fresh air is of most value and there is a possibility of producing poisoning by vaporizing carbolic acid preparations.

During a fit of coughing, it is well to support the child's head, and if he ceases temporarily to breathe, he should be slapped on the chest and face with a wet towel.

Interference with sleep caused by coughing, and loss of proper nourishment through vomiting, lead to wasting and debility. Teaspoonful doses of emulsion of cod-liver oil three times daily, after eating, are often useful in convalescence, and great care must be exercised at this time in order to prevent exposure and pneumonia.

Change of air and place will frequently hasten recovery remarkably in the later stages of the disease. Vaccines made from the killed germs of whooping-cough have been recently injected under the skin for the prevention and cure of the disease, with reported success. They are particularly useful in preventing whooping-cough during epidemics.

#### TYPHOID FEVER

Through ignorance, which prevailed before the more exact methods now used for a diagnosis were available, the diagnosis of the disease was often doubtful and various terms, such as gastric fever, slow fever, nervous fever, some forms of malaria, and mountain fever, were applied to cases of true typhoid fever. To-day in regions remote from medical centers the same mistakes are made, and therefore proper precautionary measures are not employed. The importance of these may be realized when it is known that the excre-

tions of one typhoid patient in polluting water or food has led to thousands of fresh cases and hundreds of deaths.

Typhoid fever is a communicable disease caused by a germ which attacks the intestines chiefly, but also invades the blood, and at times other parts of the body. It is characterized by continued fever, an eruption on the skin, tenderness and distention of the bowels, and often diarrhea.

It is common in all parts of the world in temperate zones, and occurs more commonly from July to December in the north temperate zone, and from February to July in the south temperate zone. It is most prevalent in the late summer and autumn months, and after a hot, dry summer. Persons between the ages of fifteen and thirty are more prone to typhoid, but no age is exempt. The sexes are almost equally liable to the disease; the robust succumb as readily as the weak. One attack usually protects the patient from another, though this is not always the case.

**Cause and Mode of Communication.**—The typhoid germ is always the immediate cause of typhoid fever. It enters the body through the mouth, in water, milk, and other foods. The food and water is contaminated with the germ through the bowel discharges or urine of patients coming into direct contact with them, or by the urine or bowel discharges coming indirectly into contact with food or water through soiled hands, flies, and dust.

Water was formerly the chief source of large epidemics of typhoid because the water supply was not protected from contamination with the excretions of typhoid patients. Thus in Massachusetts before public water supplies were in vogue there were ninety-two deaths from typhoid fever among one hundred thousand inhabitants annually, while thirty-five years later with public water supplies there were only nineteen deaths in the same population.

To-day typhoid fever is rather a disease of the country than city. The sanitary preventive measures are enforced to much greater extent in the city and the water supply is free from typhoid contamination.

Milk to-day is said to be the one most frequent cause of typhoid fever in New York City. Milk becomes contaminated with typhoid



germs through polluted water used to wash utensils, and through handling of milk by typhoid carriers, by patients, or by those caring for patients. The germ multiplies rapidly in milk and may be present also in milk products which have not been cooked, as ice cream. Proper pasteurization of milk or boiling will make it safe to drink.

Flies are a common medium of communication of the disease by first lighting on the nose, mouth, or discharges of typhoid patients and then conveying the germs directly to milk, or other food which is not cooked before taken. Improper care of excrement and urine, with the assistance of flies, has been responsible for the enormous epidemics in military camps. In the Spanish-American war one-fifth of all our soldiers in permanent camps contracted the disease. In the upper layers of the soil typhoid germs may live for six months through the frost and thaws.

Direct contamination of drinking water by the excretions of typhoid fever is prevented by modern sewage systems. It has apparently been determined that typhoid germs will live only three days in drinking water. Running streams, in quickly carrying the germs over long distances in a short time, are much more dangerous than still water, which has become polluted at one point.

Of late years so-called "typhoid carriers" have been found responsible for many cases of the fever. These persons are those who have had the disease and still carry the germs about in their bodies, chiefly in the gall-bladder and bile passages of the liver. The germs are constantly being thrown into the bowels with the bile, and escaping in the excrement. The hands of the person become soiled with the typhoid germs and in turn contaminate food. Thus many of the typhoid carriers (who have been discovered) have been cooks, and leave a trail of typhoid behind them. In one recent case a dairyman was a typhoid carrier for over twenty years, and caused an epidemic of hundreds of cases of typhoid fever before the source of the infection was traced to him.

Sewer gas and emanations from sewage and filth cannot in themselves cause typhoid fever. If the germ finds its way into filth the latter affords food for its growth and thus is indirectly a dan-



gerous substance, if contaminating food or water, or transmitted by flies.

Oysters growing near the outlets of sewers are also carriers of typhoid germs and sometimes are the cause of typhoid fever, if eaten raw. Dust is an occasional medium of communication of the germ. It is probable, however, that the germ in dust acts only on man by contaminating food or drink, and does not enter the body through the lungs. It has been suggested that the dust of railroad tracks may be a source of danger since human excrement is often deposited there by irresponsible men leading a life that renders them subject to typhoid fever.

Ice may harbor the germs and these may withstand freezing for a few months before being killed. Epidemics have been traced to this source. Clothing, wood, utensils, door handles, etc. (and the bodies of the patients themselves), which have been contaminated by contact with discharges from patients, may prove media for communication of the typhoid germ to healthy individuals.

Typhoid germs escape from those sick with the disease, chiefly in the bowel discharges and urine; sometimes in the sweat, saliva and vomited matter. Typhoid fever is wholly preventable and will probably be stamped out in time, as has already been done in certain regions.

**Period of Development.**—From eight to twenty-three days elapse from the time of entrance of typhoid germs into the body before the patient is taken sick. One attack usually protects a person from another, though two or three attacks are not unheard of in the same individual.

**Symptoms.**—Typhoid fever is subject to infinite variations, but it will here be only possible to outline what may be called a typical case. In a book of this kind the preliminary symptoms are of most importance in warning one of the probability of an attack, so that the prospective patient can govern himself accordingly, as in no other disease is rest in bed of more value. Patients who persist in walking about with typhoid fever for the first week or so of the disease are most likely to have serious forms of the fever.

The average duration of the disease is about one month. During

the first week the onset is gradual, the temperature mounting a little higher each day—as  $99.5^{\circ}$  F. the first evening,  $100^{\circ}$  the second,  $101^{\circ}$  the third,  $102^{\circ}$  the fourth,  $104^{\circ}$  the fifth,  $105^{\circ}$  the sixth, and  $105.5^{\circ}$  the seventh. The temperature may never reach over  $104^{\circ}$  F., however, and sometimes a lower point.

In the morning of each day the temperature is usually a degree or more lower than that of the previous night. From the end of the first week to the beginning of the third, the temperature remains at the highest point, being about the same each evening and falling a degree or two in the morning. During the third week the temperature gradually falls, the highest point each evening being a degree or so lower than the previous day, while in the fourth week the temperature may be below normal in the morning and a degree or so above normal at night.

After the entrance of typhoid germs into the bowels and before the recognized onset of the fever there may be lassitude and disinclination for exertion. The disease begins with headache, backache, loss of appetite, sometimes a chill in adults or convulsions in children, soreness in the muscles, pains in the belly, nosebleed, and occasionally vomiting and diarrhea. There is very often a severe cough, the face becomes flushed, the pulse rapid, and the temperature perhaps  $100^{\circ}$  F., and increasing as described above.

These symptoms are to a considerable degree characteristic of the beginning of many acute diseases, but the gradual onset continuing over days, the constant fever, nosebleed, and looseness of the bowels are most suggestive symptoms. Diarrhea occurs in about fifty per cent. of cases. Constipation throughout the disease is not at all uncommon. If at the end of the first week or ten days of fever, pink-red spots like flea bites appear on the chest and belly, to the number of two or three, or a dozen, or very numerous, and disappear on pressure only to return immediately, the diagnosis of typhoid fever is fairly certain. These so-called rose spots often appear in crops during the second and third week, remain for a few days and depart.

Headache is apt to be severe for the first week. During the second week there is often delirium and wandering at night; the

headache disappears but the patient is stupid and has a dusky flushed face. The tongue becomes brownish, its surface cracked, and the teeth covered with brownish matter. The skin is generally red, the belly distended and tender. There are often from three to ten loose bowel discharges daily, of a light-yellow, pea-soup nature, having an offensive odor. The pulse ranges from 80 to 120 a minute.

During the third week, in cases of moderate severity the general condition begins to improve with lowering of the temperature, clearing of the tongue, and less frequent bowel movements. But in severe cases the patient becomes weaker with rapid, feeble pulse, ranging from 120 to 140. There is a stupor and muttering delirium; twitching of the wrists, and picking at the bed clothes, with general trembling of the muscles in movement, slow, hesitating speech, and emaciation, while the urine and feces are often passed unconsciously in the bed.

Occasionally the patient with delirium may require constant watching to prevent him from getting out of bed and injuring himself. He may appear insane and patients have not infrequently committed suicide while mentally deranged from typhoid fever.

During the fourth week, in favorable cases, the temperature falls to normal in the morning, the pulse is reduced to eighty or one hundred, the diarrhea ceases and natural sleep returns. Among the many and frequent variations, from the type described, there may be a fever prolonged for five or six weeks with a good recovery. Chills are not uncommon during the disease, sometimes owing to complications.

Relapse, or return of fever and other symptoms, occurs in about ten per cent. of the cases. This may happen more than once, and as many as five relapses have been recorded in one patient. A slight return of fever for a day or two is often seen, owing to error in diet, excitement or other imprudence, after apparent recovery. Pneumonia, perforation of and bleeding from the bowels, are the most frequent dangerous complications.

Unfavorable symptoms are: continued high fever ( $105^{\circ}$  to  $106^{\circ}$  F.), marked delirium, trembling of the muscles in the early stages of the disease, and bleeding from the bowels. Also intense and

sudden pain with vomiting, indicating perforation of the bowels. The result is more apt to prove unfavorable in very fat patients, especially so in persons who have walked about until the fever has become high. Bleeding from the bowels occurs in four to six per cent. of all cases and causes fifteen per cent. of deaths. Perforation of the bowels happens in one to two per cent. of all cases, and produces ten per cent. of the deaths.

**Diagnosis.**—It is impossible for the layman to positively determine the presence of typhoid in any given patient, but when the symptoms follow the course above indicated a probable diagnosis may be made. Unusual types of typhoid fever are among the most difficult and puzzling cases a physician has to diagnose.

Hitherto the doctor could rarely make a positive diagnosis before the end of a week or ten days, but there are now tests by which an earlier diagnosis may be made. These depend upon finding the germ in the blood, by taking a little blood from a vein by means of a needle, and also by examination of the blood to determine the number of white cells. The finding of the special germ in the blood requires the employment of a well-equipped bacteriologist and laboratory. The examination of a drop of dried blood, collected on paper, may determine the presence of the disease after the patient has been sick for a week or ten days. Such a specimen may be sent by mail for examination.

Typhoid fever, especially when there are chills, is often mistaken for malaria, when occurring in malarial regions, and may be improperly called "typhoid malaria." There is no such disease, although rarely the two diseases may coëxist in the same person at the same time. Examination of the blood will also determine the presence or absence of malaria.

**Complications and Sequelae.**—These are very numerous. Among the former are diarrhea, delirium, mental and nervous diseases, bronchitis, pleurisy, pneumonia, ear abscess, perforation of and bleeding from the bowels, inflammation of the gall-bladder, disease of the heart, kidney, and bladder, and many rarer conditions depending upon the organ which the germ invades.

Among the sequelae are boils, baldness, bone disease, painful



spine, and, less commonly, insanity and consumption. While convalescence requires weeks and months, the patient often gains greatly in flesh and feels made anew, as in fact he has been to a great extent, through the destruction and repair of the tissues.

**Mortality.**—The mortality varies greatly under different conditions, and in different epidemics, and is to some extent altered by treatment. The death rate in the 20,000 cases in the Spanish-American war was but seven per cent., representing that in the best hospitals and in private practice. Osler gives the death rate as five to twelve per cent. in private practice, and seven to twenty per cent. in hospital practice since the cases are more advanced and often poorer subjects in hospitals.

The chances for recovery are above the average in patients under fifteen years and between the twenty-second and fortieth years.

**Prevention.**—One of the most life-saving discoveries of recent years has been the use of a so-called vaccine for the prevention of typhoid fever. It is practically a sure preventive if used before exposure to the disease, and the immunity conferred lasts about two to four years, when re-vaccination may be done.

The vaccine is a watery suspension of five hundred million killed germs of the disease which is injected at one dose under the skin. Double this dose is injected once on the tenth day after the first injection, and again on the twentieth day after the first injection, three doses in all, ten days apart. No dangerous symptoms or deaths have ever resulted, although rarely there is some fever, vomiting, and local soreness at the point of injection. There is usually not nearly as much discomfort caused by typhoid vaccination as by the ordinary vaccination against smallpox. The results of vaccination against typhoid fever are shown in the mobilization of United States troops on our Mexican border in 1911. Among 20,000 thus vaccinated there were only two cases of typhoid fever and no deaths. Compare this with our military camp at Jacksonville, in the Spanish war, where there were 1,729 cases of typhoid fever among 10,759 soldiers, situated in similar circumstances and for the same length of time—four months.

The record of the Japanese war department shows that among

12,915 vaccinated troops in garrison, there were thirteen cases of typhoid among the vaccinated, and 294 cases among 20,245 unvaccinated soldiers at the same time.

In an addition to this special method of protection against typhoid fever there are the general precautions to be observed in guarding the attendant against the disease, especially if unvaccinated, and in preventing its communication to others. In a time of typhoid fever epidemic all water and milk for household uses and drinking purposes should be boiled, and all food should be cooked before being eaten. Flies should be kept away from all food, from patients, and their discharges.

In the care of the patient the chief means of preventing the spread of the disease is by destruction of the germs in the feces and urine. The bowel discharges and urine should be mixed with three times their bulk of milk of lime (made by mixing one part of freshly slaked lime and four parts of water), and should stand in this mixture for an hour before being emptied. Instead of milk of lime, a solution of carbolic acid (one part in twenty parts of hot water) may be used to the extent of three times the bulk of urine, and the mixture should stand an hour before being emptied. All dishes and eating utensils should be boiled five minutes after use by the patient, and the bed or body linen should be soaked in the carbolic acid solution noted above for two hours before being sent to the laundry. The patient's expectoration should be received on old cotton cloth, and should be burnt. The bedpan should always contain carbolic acid solution. The attendant should always wash his hands after touching the patient or objects which have touched the patient, or his discharges.

It is safer for the nurse to wear a long sleeved apron while with the patient, and to wear rubber gloves while handling the bedpan or urinal, or cleansing the patient. These should be boiled after use.

As the germs exist in the saliva, kissing the patient should be tabooed and even touching the skin may be dangerous since the germ sometimes is found in the sweat of the sufferer. Nurses and persons below forty-five years old who travel or live in regions

subject to the disease should be vaccinated against typhoid fever.

**Treatment.**—There is perhaps no disease in which the services of a physician are more desirable or useful than in typhoid fever, on account of its prolonged course, and the number of complications and incidents which may occur during its existence.

It is the duty of the physician to report cases of typhoid fever to the health authorities and thus act as guardian of the public health. If, however, one should happen to have the care of a typhoid patient remote from medical aid, it is a consolation to know that the outlook is not greatly altered by medicine or special treatment of any kind. There have been epidemics in remote parts of this country where numbers of persons have suffered from typhoid without professional care and yet with surprisingly good results. In an epidemic in Canada, twenty-four persons became ill with typhoid and received no medical care or treatment whatever, and yet but one death resulted.

Nursing is the main factor and the essentials in treatment are rest, diet, and bathing.

*Rest.*—Rest to the extent of absolute quiet in bed, at the first suspicion of typhoid, is requisite in order to avoid exhaustion and the dangers of perforation of the bowels resulting from ulceration. The patient should be assisted to turn in bed; he must make no effort to rise during the sickness, and should pass urine and bowel discharges in a bedpan or urinal under cover. In case of bleeding from the bowels the bedpan should not be used but the discharges may be received for a time in cloths, without moving the patient. It is especially necessary for the attendant to wear rubber gloves when handling the bedpan, body, or clothing soiled with urine or feces, since these hold the germs of the disease.

*Diet.*—The diet, until recently, has generally been confined to liquids. Dr. Fred. Shattuck, of Boston, has, however, shown that a more liberal diet may be given with advantage to the patient. Thus milk, broths, purées, strained gruels, ice cream, junket, raw, soft boiled or lightly scrambled eggs, raw oysters, rice, macaroni, orange or grape juice, and the soft part of baked or stewed apples form a suitable diet. Light feeding every two hours, except during a portion



of the sleeping period, is advised—a cup of liquid or some of the other articles mentioned.

Soft custard, egg nog, jellies, coffee and cocoa, white of raw egg, strained and diluted with an equal amount of water and flavored with a few drops of lemon juice or brandy, or four table-spoonfuls of juice squeezed from beef may be used also to add to the variety.

At the end of the first week of normal temperature, finely scraped, raw or rare beef, and soft toast may be allowed. These may even be given during the disease when fluids are not obtainable or not well borne. An abundance of water should likewise be supplied the patient throughout the disease to aid in eliminating the poisons produced by the germs. The object of the liquid and soft diet is to avoid irritation of the ulcerated bowels and prevent bleeding and perforation. Milk was formerly the almost sole article of diet, but is found not to agree with patients as well as the mixed diet described. Some authorities avoid milk altogether.

*Bathing.*—The importance of cold water in typhoid fever is enormous—both in reducing the temperature and in stimulating the nervous system and relieving restlessness and delirium. Bathing is usually done when the temperature rises above 102° F., and may be repeated every two or three hours, if restless; delirium and high fever require it.

The immersion of patients in tubs of cold water, as practiced with benefit in hospitals, is out of the question when trained nurses and portable tubs are not available. The patient should have a woven wire spring bed and soft hair mattress, over which is laid a folded blanket covered by a rubber sheet. Sponging the naked body with ice water will suffice in some cases. When the temperature is over 102.5° F. the whole body may be enveloped in a sheet wet in water at 65° F. The surface of the sheet should then be rubbed with lumps of ice, or with cloths wet with ice water, for ten or fifteen minutes. Rubbing of the chest and sides of the body is necessary during the application of cold to prevent shock. The use of a cold cloth on the head and a hot water bottle at the feet, during the application of cold, is also desirable.



In children and others objecting to these cold applications, the vapor bath is effective. For this a piece of cheese cloth (single thickness) is wet with water—at a temperature of  $100^{\circ}$  to  $105^{\circ}$  F.—and is wrapped about the naked body from shoulders to feet, being kept continually wet by sprinkling it with water at  $98^{\circ}$  F. The evaporation of water will usually, in fifteen to twenty minutes, cool the body sufficiently if the patient is fanned continuously by two attendants.

In warm weather the patient should be covered only with a sheet for a while after the bath, which should reduce the temperature two to three degrees. A hot water bottle at the feet and a little brandy or whisky, given before sponging if the pulse is feeble, will generally prevent a chill. Patients should be gently dried after a bath and covered with dry bed clothing. The utmost care should be taken not to agitate a feeble patient during the process of sponging.

*General Care.*—The long period in bed favors bed sores. These are apt to appear about the lower part of the spine, and begin with redness of the skin, underneath which a lump may be felt. Constant cleanliness and bathing with alcohol diluted with an equal quantity of water, and the application of a paste made of nearly equal parts of alcohol, castor oil and zinc oxid to the reddened area will prevent their occurrence. Moving the patient, so he will lie on his side, and keeping the bed clothes smooth under him together with the use of a rubber ring air cushion, under the base of the spine, are all serviceable.

Brandy or whisky diluted with water are valuable in severe cases with muttering delirium, dry tongue, and feeble pulse. They are not called for before the end of the second week, and not in mild cases at any time. A tablespoonful of either, once in two to four hours, is usually sufficient.

Pain and distention of the abdomen are relieved by applying a pad over the whole front of the abdomen—consisting of two layers of flannel wrung out in a very little hot water containing one teaspoonful of turpentine—and should be covered by a dry flannel bandage wrapped about the body. The avoidance of milk in this

condition is also advisable. In case of great distention two tablespoonfuls of castor oil will act favorably in many cases.

The mouth, teeth, and tongue should be carefully cleaned three times a day with a swab of absorbent cotton wet in a solution of boric acid (as much as water will dissolve). The lips may be kept moist by rubbing glycerin on them. Spraying the throat three times daily with Dobell's solution will prevent the complication of ear abscess.

Diarrhea is checked by giving one-quarter of a level teaspoonful dose of bismuth subcarbonate with a teaspoonful of paregoric,<sup>1</sup> once every three hours if there are more than four loose movements in twenty-four hours. Constipation is relieved by the daily use of an injection of soapsuds to which may be added an ounce or two of glycerin.

Bleeding from the bowels is treated by keeping the patient absolutely quiet, by giving lumps of ice by the mouth, and withholding nourishment for thirty-six hours. An icebag should always be kept continuously over the abdomen. Fifteen drops of laudanum<sup>1</sup> should be given to adults. No sponging or bathing should be done.

As a matter of routine, patients may be allowed to sit up during typhoid fever after a week of normal temperature has passed. Solid food is not to be allowed until two or three weeks, after the fall of fever, and then very gradually avoiding all coarse, uncooked vegetables and fruit.

#### EPIDEMIC CEREBROSPINAL MENINGITIS

**Mode of Infection.**—Meningitis is an acute infectious and contagious disease, occurring both in isolated cases and in epidemics. Sudden changes in temperature and humidity, by producing colds, tend to favor the occurrence of the disease—for the meningitis germs gain entrance into the blood through the nose and throat, and apparently more readily in persons who already have catarrh of these parts. Moreover, the germ of meningitis itself causes colds, so that a cold may be the beginning of meningitis.

<sup>1</sup>Paregoric and laudanum can only be bought on a doctor's prescription.

In epidemics there are great numbers of healthy persons who carry about the meningitis germs in their noses and throats without having the disease themselves. These so-called "carriers" may number from ten to thirty times the actual number of meningitis cases. Among those in close contact with meningitis patients, as many as seventy to eighty per cent. may become healthy carriers and so pass along the germs to others, who may in turn become carriers or may succumb to the disease.

The contagiousness is comparatively slight, and doctors and nurses do not fear meningitis—in some hospitals there has never been a case from contact. It may be compared to pneumonia in this respect, but in epidemics the danger of contagion is greater. Only a small percentage of carriers take the disease, but they are the chief means of spreading it.

While the germ generally dies in the throat of patients and carriers within a few weeks, patients may occasionally become carriers of the meningitis germ for months or years. These are especially dangerous, because they spread the disease far and wide—often into foreign countries.

**Development.**—The average time elapsing between the entrance of the meningitis germ into the throat and the development of the first symptom varies from one to five days. It may happen that the germs lurk in the throat a long time before they get into the blood. This may account for the very wide variations in the time occasionally observed after exposure, before the development of the disease.

**Symptoms.**—There are many variations of this disease, but only the more common symptoms will be described. The patient may have been suffering from a cold, when he is suddenly attacked with chills and fever, severe headache, and pains all over the body, as in grippe, and also with dizziness and violent vomiting.

There are apt to be restlessness and irritability; the pupils are dilated; cold sores or fever blisters appear about the lips and chin. There may or may not be fever; there is tenderness about the angle of the jaw, and soreness is felt on tapping the head. This is the stage corresponding to the entrance of the germs into the blood.



It may last but a few hours or a day, and then appears the second stage, produced by the pressure of increasing fluid under the membranes surrounding the brain and spinal cord.

This often begins with convulsions; the patient is extremely sensitive to noise and light; the mind wanders, or there is a mild delirium or stupor. The pain in the head, back of the neck, spine, and leg is severe; the neck becomes rigid; and the head is drawn back. A young patient may often be lifted from the bed by raising the head alone.

If the finger nail is drawn firmly over the skin of the patient a marked red line remains. The face is often congested and bluish, the breathing is irregular; the pulse is slow or rapid. There is frequently partial deafness. A sign peculiar to the disease is seen when the thigh is bent on the abdomen by an attendant and an attempt is then made to straighten out the leg. The leg cannot be brought to much more than a right angle. There are occasional cases in which all the early symptoms appear, only to disappear within forty-eight hours, whereas in other cases death occurs within a few hours.

The course of the disease is very irregular. With the modern serum treatment recovery is often complete in a few days, or a week or two. Without this treatment cases may drag along for weeks or months with great emaciation, and patients are often apparently both deaf and blind, the limbs are drawn up, and the joints are frequently stiff and swollen. Headache, stupor, convulsions, and vomiting are common, with irregular fever.

The diagnosis between the epidemic cerebrospinal meningitis and other non-contagious forms is too difficult for the layman to attempt. A non-contagious form due to tuberculosis is the most common, but is seen more often in infants under two years of age. It is only when meningitis is epidemic that the layman would be likely to make a correct diagnosis from the description herein given. It is of the utmost importance to secure the best medical aid at the earliest moment so that the doctor may withdraw a sample of the fluid within the spinal canal, from which a positive diagnosis may be made, and thus the earliest treatment be given.

**Treatment.**—The method of injecting serum in the cure of epi-



demic meningitis, introduced by Simon Flexner, has had as remarkable a life-saving effect in this dreaded disease as antitoxin in diphtheria.

Flexner's serum is prepared by injecting subcutaneously into horses first the products of the living meningitis germs, and following this the germs themselves, in gradually increasing doses. The horses do not acquire the disease, but are made somewhat sick by the injections, and gradually become immune to meningitis. After four months they are bled, and the clear portion of the blood which separates out on standing (serum) is used for treatment of human beings with meningitis.

First the fluid caused by the disease is drawn off from the spinal canal through a hollow needle, introduced at the lower part of the back of the patient, and then from one teaspoonful to two tablespoonfuls of horse serum, prepared as above, is injected in its place. The injections should be made daily for four days. When done properly the injections cause little pain, and in 1500 done by Sophian, there was not a single bad result.

Withdrawing the fluid from the spinal canal relieves the pressure on the brain and spinal cord, to which many of the worst symptoms are due, and also permits of the examination of the fluid which shows the gravity of the disease. The injection of the serum kills the germs in the spinal fluid, or more precisely allows the cells of the body to kill them.

In the late epidemic in Texas, 1,394 cases of meningitis were treated with serum with a death rate of thirty-seven per cent.; while the death rate in 562 cases without serum was seventy-seven per cent. Early and skillful treatment is the most successful. Sophian treated 161 cases with serum, and lost but 15.5 per cent. No other treatment is of much value.

**Prevention.**—In epidemics, those exposed to the disease should first gargle the throat and spray the nose with salt and water, and follow this with a spray and gargle of hydrogen peroxid (1 part) mixed with water (5 parts). If this is done three times daily the germs will disappear from the throat of carriers within three days, in ordinary cases, to ten days in the most resistant. Also, if exposed

persons take ten grains of urotropin in a glass of water three times daily, it, being a strong antiseptic, will tend to protect them.

Vaccination with the dead germs of meningitis, as for typhoid (described in this chapter) and given in the same way, appears to protect persons for a year against the disease. It is the best method of prevention we have, and is without danger. Headache, fever, and vomiting rarely follow vaccination the first few hours.

The United States Public Health Service has issued the following rules:

#### INFORMATION REGARDING PREVENTION OF MENINGITIS

1. The germ which causes epidemic cerebrospinal meningitis has been found only in the human body.

2. Healthy persons may carry the germ in their nose and throat without ever developing the disease. Such persons are known as carriers. There are about ten carriers to every case of meningitis in an infected locality.

3. The measures for lessening the spread of the germs of this disease are as follows:

(a) The nose and throat should be kept clean. For this purpose cleansing sprays may be used.

(b) Careful attention to personal hygiene, mainly cleanliness. Avoid chilling of the body and other depressing influences. Dress to meet the changes of weather.

(c) Avoid close contact with persons. Healthy persons who are carriers may innocently transmit the germs, which may be in their nose and throat, by coughing, sneezing, kissing, talking, etc.

(d) Children should not use articles which may have come in contact with the mouths of others, such as pencils, particles of food, drinking cups, handkerchiefs, and the like.

(e) Cleanliness of premises and free ventilation of houses are necessary. The germ of this disease is easily killed when exposed to drying and sunlight. Hence it is important to thoroughly ventilate and expose to sunlight all occupied rooms.

(f) The disease is not carried by clothing, merchandise, etc.

(g) Persons suffering with "colds"—that is, nasal catarrh, sore throat, or cough—should be careful in the presence of others, and seek early medical attention and relief.

Handkerchiefs wet with discharges from the nose or throat should be disinfected by boiling in water.

## CHAPTER IX

### INFECTIOUS DISEASES (*Continued*)

#### **DISEASES DUE SOLELY TO THE BITES OF MOSQUITOES— MALARIAL AND YELLOW FEVER**

Malaria, including chronic pernicious, intermittent, remittent, typhomalarial, and black-water fever. Yellow fever.

##### **MALARIA**

**Cause and Mode of Communication.**—Malaria is a communicable disease characterized by attacks of fever occurring at certain intervals, and due to a minute animal parasite which inhabits the body of the mosquito, and is only communicated to man by the bites of this insect.

In accordance with this definition, malaria is not a contagious disease in the sense that it is acquired directly from the sick. It is derived from the bites of certain kinds of mosquitoes and can be contracted in no other way, despite the many notions to the contrary.

Mosquitoes in their turn acquire the malarial parasite by biting human beings suffering from malaria. It thus becomes possible for one malarial patient, coming to a region hitherto free from the disease, to infect the whole district with malaria, through the medium of mosquitoes.

While the parasite-bearing mosquito is the only cause of malaria, certain circumstances are requisite for the life and growth of the mosquito and parasite; these are moisture and proper temperature, —the latter should not average less than 60° F. for the growth of the mosquito. The malarial parasite also will not grow if the climate

be too cold. The malarial parasite only exists in man and the mosquito, so far as is known.

**Development.**—Malaria is prevalent in temperate climates, in the summer and autumn months particularly, less often in spring and very rarely in winter. It is common in the tropics and subtropics all the year round, but more frequently in the spring and fall of these re-

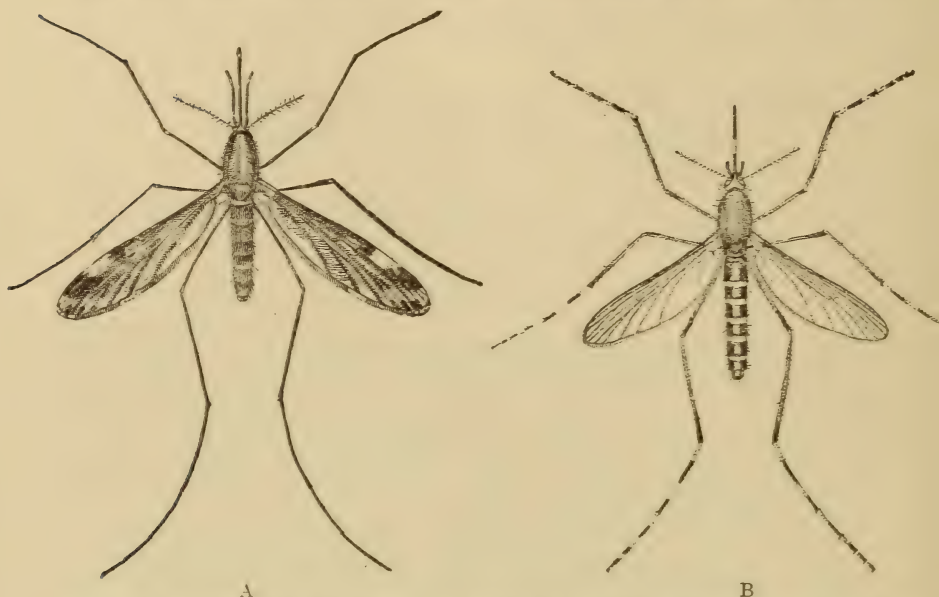


FIG. 54.—A. ANOPHELES MOSQUITO. B. CULEX OR COMMON MOSQUITO. (After Doty's "The Mosquito.")

gions. The older ideas that malaria was caused by something arising in vapors (malaria literally means *bad air*) from wet soil, marshes, or bodies of water, by contamination of drinking water, by night air, by sleeping outdoors or on the ground floors of houses, are only true in so far as these conditions favor the presence of malarial mosquitoes. Those digging in moist soil, as in the making of railroads, sewers, ditches, and canals, are especially subject to malaria because of especial exposure to mosquitoes. So excesses, exposure, and alcoholism predispose to the disease by weakening the natural resistance.

The negro possesses some immunity to malaria.

Two essentials are requisite for the existence of malaria in a



region—the presence of the particular mosquito and the actual infection of the mosquito with the malarial parasite. The *Anopheles* is the only genus of mosquito known to convey the malarial parasite to man. Fifty or more species have been described.

The more common house mosquito of this country is of the genus *Culex* (Fig. 54B). The *Anopheles* (Fig. 54A) may usually be distinguished from it by its mottled wings and, when on a wall or ceiling, it sits with the body protruding at an angle of  $45^{\circ}$  from the surface, with its hind legs hanging down or drawn up against the wall.

In the case of the *Culex* the body is held parallel with the wall, the wings are usually not mottled, and the hind legs are carried up over the back. The *Culex* does not convey malaria.

When a mosquito infected with the malaria parasite bites man, the parasite enters his blood along with the saliva that anoints the lancet of the mosquito. The parasite is one of the simplest forms of animal life, consisting of a microscopical mass of living, moving matter which enters the red blood cell of man, and there grows and undergoes changes. After a variable time it multiplies by breaking into a number of still smaller bodies which represent a new generation of young parasites.

It is at that stage in the development of the malarial parasite in the red blood cells of man, when the segment breaks through the blood cells into the liquid portion of the blood, that the attack of chills and fever occurs. What causes the malarial attack at this point is unknown, unless it be that the parasites produce a poison at the time of their segmentation. Between the attacks of chills and fever, in malaria, there is usually an interval of comparative health lasting some hours or days, and corresponding to that period occupied by growth of the new crop of parasites, up to that time when they again burst open the red cells and escape into the liquid portion of the blood, and again poison the patient.

This interval between the attacks of malaria depends upon the time occupied by the growth of the particular kind of parasites infecting the human blood. The common form of malaria (tertian) is caused by a parasite requiring forty-eight hours for its development. The malarial attacks produced by this parasite then occur every

other day, at which times the parasite undergoes segmentation. However, an attack may occur every day when there are two separate groups of these parasites in the blood, the time of birth of one set of parasites happening one day, with an accompanying malarial attack, and that of the other group coming on the next, so that between the two there is a daily birth of parasites and a daily attack of malaria.

In cases of malaria caused by one group of parasites the times of attack may vary on different days. In the worst types of malaria the parasites do not all go through the same stages of development at the same time, as is commonly the case in the milder forms seen in temperate regions, so that the fever—corresponding to the time of birth of a new crop of parasites—occurs at irregular intervals.

In a not uncommon type of malaria (quartan) the attacks occur every third day, with two days of freedom from fever. Different groups of parasites causing this form of malaria and inhabiting the same person will have different times of segmentation, and thus give rise to variation in the times of attack. An attack may even occur on two successive days with a single day of intermission.

Malaria is very widely distributed, and is much more severe in tropical countries and in the warmer parts of temperate regions. In New England the disease has been prevalent along the valleys of the Connecticut and Charles Rivers, but is much less frequent at present. So also in the cities of New York, Philadelphia and Baltimore, it is less common than formerly, and is of a comparatively mild type. More severe forms prevail along the Gulf of Mexico and the banks of the Mississippi and its branches, especially in Mississippi, Texas, Louisiana, and Arkansas, but even here it is less fatal and widespread than formerly. In Alaska, throughout the Northwest, and on the Pacific coast it is practically unknown, while it is but slightly prevalent in the region of the Great Lakes, as about Lakes Erie and St. Clair.

There is no malaria in the St. Lawrence basin. In many parts of the Southern states malaria is common but less so than formerly. In the West Indies severe forms occur, except in Havana. The Atlantic Central American coast has been called "the white man's

grave," on account of malaria, but Colonel Gorgas has largely eliminated it from the Panama Canal Zone.

In the northern three-fourths of South America malaria abounds. In Africa severe forms are found everywhere except in the Sahara and in the lower part. Malaria is indigenous in the Far East, in India, Burma, Assam, and the East Asiatic coast, Japan, Asia Minor and the East Indies. In Europe malaria is most frequent in Italy, Hungary, Greece, the Balkans, and lower Russia.

**Symptoms.**—Fever occurs from one and one-half to fifteen days after entrance of the parasite into the blood. About two billion parasites in the blood are required to produce symptoms. It often happens that the parasite remains quiescent in the blood without being completely exterminated after recovery from an attack, only to grow and cause a fresh attack a month or two after the first, unless treatment with quinin has been thoroughly carried out. Certain symptoms give warning of an attack, as headache, lassitude, yawning, restlessness, discomfort in the region of the stomach, and nausea or vomiting.

The attack begins with a chilliness or creeping feeling, or there may be so severe a chill that the patient is violently shaken from head to foot and the teeth chatter. Frequently the chill is absent, and after a preliminary stage of dullness, there is fever followed by sweating. This is called "dumb ague."

Chills are not commonly seen in children under six, but an attack begins with uneasiness, the face looks pinched, the eyes sunken, the lips, tips of the fingers, and toes blue, and there is dullness and often nausea and vomiting. Then, instead of a chill, the eyelids and limbs begin to twitch and the child goes into a convulsion. While the surface is cold during a chill, the temperature, taken with the thermometer in the mouth or bowel, often reaches 102° to 105° F.

The chill lasts from a few minutes to an hour, and then it passes away, the face becomes flushed and the skin hot. There is often a throbbing headache, thirst, and sometimes a mild delirium. The temperature at this time, when the patient feels intensely feverish, is but little higher than during the chill. The fever lasts three or four hours, in most cases, and gradually declines, as well as the



headache and general distressing symptoms, to disappear in an hour or two, when the patient often sinks into a refreshing sleep.

The attacks come on usually between ten a. m. and three p. m. and last ten hours,—less often from four to forty-eight hours.

Such attacks more commonly occur every day, every other day, or after intermissions of two days. Rarely do attacks come on with intervals of four, five, six or more days. In severe cases the intervals may grow shorter, in mild cases, longer. In the intervals the patient generally feels well, unless the disease is of exceptional severity. There is entire freedom from fever in the intervals, except in the grave types common to the tropics.

#### CHRONIC MALARIA

**IRREGULAR AND SEVERE FORMS.**—Chronic malaria occurs in those who have lived long in malarial regions and have suffered repeated attacks of fever, or in those who have not received proper treatment. It is characterized by a general enfeebled state, the patient having a sallow complexion, cold hands and feet, and temperature below normal, except occasionally, when there may be slight fever.

When the condition is marked, there are breathlessness on slight exertion, swelling of the feet and ankles, and “ague cake,”—that is, enlargement of the spleen, shown by a lump felt in the abdomen and extending downward from beneath the ribs on the left side. There may be severe bleeding from the stomach and into the eyes.

Among the unusual forms of malaria are: periodic attacks of drowsiness without chills but accompanied by slight fever ( $100^{\circ}$  to  $101^{\circ}$  F.); periodic attacks of neuralgia, as of the face or chest or as sciatica; and periodic “sick headaches.” These may take the place of ordinary malarial attacks in malarial regions, and are cured by ordinary malarial treatment.

It has been found by examination of the blood that from five to thirty per cent. of persons in malarial districts are carriers of the parasites without having any symptoms of malaria themselves. The carriers are a menace to the community by infecting mosquitoes.

**REMITTENT FORM, SOMETIMES CALLED BILIOUS FEVER—TYPHO-MALARIAL FEVER.**—This type of severe malaria occurs sometimes in



late summer and autumn in temperate climates, but is seen much more commonly in the southern United States and in the tropics. It begins often with lassitude, headache, loss of appetite, and pains in the limbs and back, a bad taste, and nausea for a day or two, followed by a chill, and by fever ranging from  $101^{\circ}$  to  $103^{\circ}$  F., or more.

The chill is not usually repeated, but the fever is continuous, often suggesting typhoid fever. With the fever there is flushed face, occasional delirium, more often a drowsy state, and vomiting of bile. After twelve to forty-eight hours the fever abates, but the temperature does not usually fall below  $100^{\circ}$  F., and the patient feels better but not as well as in the ordinary form of malaria where the fever disappears wholly between the attacks. After an interval varying from three to thirty-six hours, the fever rises again and the more severe symptoms reappear. In this way the disease continues, there never being complete freedom from fever—the temperature sometimes rising as high as  $105^{\circ}$  to  $106^{\circ}$  F. In some cases there is nosebleed, cracked tongue, brownish deposit on the teeth, and a delirious or stupid state, as in typhoid fever, but the distention of the belly and the diarrhea and rose spots are absent.

Typhomalarial fever is not an entity but the two diseases, typhoid fever and malaria, may occur in the same individual at the same time. This indeed frequently happened in our soldiers coming from the West Indies in the Spanish-American war, but it is an extremely uncommon event in the United States.

#### PERNICIOUS MALARIA

This is a very grave form of the disease. It is rarely seen in temperate regions, but often occurs in the tropics and subtropics. It may follow an ordinary attack of chills and fever, or come on very suddenly. After a chill the hot stage appears, and the patient falls into a deep stupor or unconscious state, with flushed face, noisy breathing and high fever ( $104^{\circ}$  to  $105^{\circ}$  F.). Wild delirium or convulsions afflict the patient in some instances. The parasites actually plug the blood vessels of the brain in these cases. The attack may last from six to twenty-four hours, from which the patient may recover, only to suffer another like seizure, or he may die in the first.

Another form resembles true cholera, and is peculiar to the tropics. In this there is violent vomiting, watery diarrhea, cramps in the legs, cold hands and feet, and collapse. Sometimes these attacks begin with a chill, but fever, if any, is slight, although the patient complains of great thirst and inward heat. The pulse is feeble, the breathing shallow, but the mind remains clear. Death often occurs in this, as in the former type of pernicious malaria, yet vigorous treatment with quinin, iron, and niter will frequently cure either form.

*Black Water Fever.*—A third form of pernicious malaria is one with bleeding from various parts of the body. Thus in black water fever the urine becomes very dark, owing to the escape of blood into it. There are two varieties of this form: One is apparently simply a very severe type of malaria in which great numbers of red cells of the blood are destroyed while the coloring matter is eliminated by the urine.

At other times, in addition to the infection with the malarial parasite, the action of quinin aids in the destruction of the red blood cells, together with the influence of the lowered resistance produced by previous malaria and the poison set free in the blood by a renewed malarial attack. This form is seen in the Southern states and in the tropics, especially Africa and South America. There have been several hundred cases of black water fever during the building of the Panama Canal. There may be chilliness and irregular fever before the voiding of dark urine, and jaundice is also usually present. It may be safer not to give quinin in this form of malaria.

**Diagnosis.**—To the well-educated physician is now open an exact method of determining the existence of malaria, and of distinguishing it from all other fevers, by the examination of the patient's blood for the malarial parasite or plasmodium—its presence or absence deciding the presence or absence of malaria. For the layman the following points are offered: first the occurrence of attacks of chills, fever, and sweating, remembering that the chills and sweating may be frequently wanting. The fever more often begins in the early part of the day, whereas most common fevers are at their height in the late afternoon.

The intermittency of attacks of fever in a person coming from a malarial region is most suggestive of malaria. Intermittency of attacks of chills, fever, and sweating is not confined to malaria, however, as these symptoms often occur in blood poisoning. The quinin test is the best. If a fever is not cured by a daily dose of twenty to thirty grains of quinin—continued for four days—the disease is not malaria, except in the tropics when larger doses may be required (Laveran). This treatment will do no harm even if the disease is not malaria. Many cases of malaria will recover without the use of quinin.

**Prevention.**—Since the French surgeon, Laveran, discovered the parasite of malaria in 1880, and Manson, in 1896, presented irrefutable evidence for all time that the mosquito is the medium of communication to man, the way for the extermination of the disease has been plain. “Mosquito engineering” has attained a recognized place. Malaria has been eliminated from Havana by the efforts of the United States Army surgeons, following American occupancy. Colonel Gorgas has attained worldwide fame for transforming the “white man’s grave” (and black too) at Panama, into a salubrious region with a death rate resulting from disease lower than that of any civilized country. In the French occupancy of the Canal Zone the mortality reached 177 per thousand, while under Colonel Gorgas it has fallen to 7.5 per thousand chiefly through the elimination of malarial deaths.

The means required for the prevention of malaria include the following: destruction of the abodes of mosquitoes in marshes, ponds, and pools by draining, filling, and planting eucalyptus, corn and sugar cane (the work should be done by immunes or by whites who work under careful medical supervision); the application of crude petroleum or kerosene to the surface of stagnant water and the placing of fish in such; on large bodies of water, only the edge may be thus treated, where most of the immature mosquitoes are to be found; for streams a constant drip may be used; open water barrels and tanks must be abolished; the protection of persons from mosquito bites is obtained by proper screening of the house, and by the use of a screened porch, while the screening of the bed is use-



less because people protrude their limbs in sleep. Persons should not go into the open unscreened air at or after nightfall, when the pests are most in evidence. Dwellings on high ground are less liable to mosquitoes. All *Anopheles* found in dwellings should of course be killed.

Adults in malarial regions should take two grains of quinin, in capsules, three times daily at meals (from April to November), to kill any malarial parasites which may invade the blood, and at the same time they should observe the measures suggested to avoid malaria (p. 414). Patients recovering from malaria should take prolonged treatment, as advised below, renewing it each spring and fall for some years.

A malarial patient, and those in malarial regions who harbor the parasite without themselves suffering, should be protected from the bites of mosquitoes since these insects may convey the disease broadcast. A malarial patient, or carrier of the parasite, is thus a menace to the whole community unless he observes sanitary precautions.

**Treatment.**—The patient should remain in bed and take only liquid and soft food, as milk, soups, soft egg, cereal, and toast. At night three grains of calomel should be given in one dose to an adult and followed, on waking in the morning, by a tablespoonful of Epsom salts in a whole glass of water.

Quinin is *the* remedy in malaria and is one of the few specifics in medicine, killing the malarial parasite in the blood without harming the patient. Quinin is capable of doing no harm unless used in large doses for months, despite the popular prejudice against it. The subjects of malaria escape the evil effects of quinin which are felt by persons with other diseases. Some ringing in the ears, and feeling of fullness in the head, and slight deafness may occur after the larger doses. When quinin does not agree with patients euquinin may be used. Quinin produces the acme of its effect in malaria when there is the greatest amount in the blood at the time of the attack, when the spores or immature parasites escape from the red blood cells into the liquid portion of the blood. A dose of twenty grains of quinin taken just before the time for an attack



may prevent another. Quinin is often adulterated and should be obtained at a reliable drug house. Neither pills nor tablets are suitable as they sometimes pass through the stomach and bowels undissolved. The drug should be taken dissolved in water, with syrup of orange peel, and a few drops of dilute sulphuric acid (which dissolves it), or in capsules or starch wafers.

Children take the solution with syrup readily. When the drug is vomited it may be given in double the dose, dissolved in half a pint of water, as an injection into the bowels, thrice daily. Infants of a few months may be treated by rubbing an ointment, thirty grains of quinin in one and one-half ounces of lard, well into the skin of the armpit and groins, night and morning. Children under the age of two can best be given quinin in suppositories (little conical bodies containing two grains each of quinin in cocoa butter), one being introduced into the bowel night and morning.

Half a teaspoonful of sodium bromid may be taken in one-half glass of water and hot drinks and hot water bottles, with warm covering, may be used during the chill, while an icecap to the head and cold sponging of the naked body will afford comfort during the hot stage. In the severe form with unconsciousness, the icecap to the head and the use of the cold bath, with vigorous friction with a rough cloth over the whole body, are valuable.

The routine method of using quinin follows: A dose of ten grains of quinin sulphate should be taken three times daily for three days, or as long as attacks persist, then a dose of three grains should be taken five times daily for two weeks; and finally three grains daily for the rest of the month of treatment will, in many cases, complete a cure. If the larger doses of quinin cause much ringing in the ears or deafness, it will be found that sodium bromid dissolved in a whole glass of water and taken at the same time as the quinin, in twice the dose, will correct this trouble. To children may be given a daily amount of quinin equal to one grain for each year of the child's age.

In the severe forms of remittent and pernicious types of malaria it may be necessary for the patient to take thirty grains of quinin in a single dose for some time every three days, but as digestion and

absorption may be poor, the drug should be taken in solution as the bisulphate of quinin with five grains of tartaric acid. The injection of the muriate of quinin and urea under the skin, in ten grain doses three times daily, will often give the best results in severe and persistent cases. This should be carried out by a doctor.

In chronic malaria a capsule containing two grains of quinin sulphate, one-thirtieth grain of arsenic trioxid, and two grains of reduced iron, should be taken three times daily for several weeks.

Change of climate is also of great value.

In black water fever the use of quinin is to be withheld, unless parasites are found in the blood, in which case it is to be employed.

In the United States Health Report of March 27th, 1914, it is stated that in malarial states the disease can usually be prevented by the taking of from five to seven grains of quinin sulphate daily in tablet form for adults; and six grains daily of quinin tannate, in two grain tablets with chocolate three times daily, for children; from April to November. It states further that these doses can produce no harm, although there may be a few cases of malaria from the existence of the parasite in the blood from the year before. In addition, the house should be thoroughly screened; brush or weeds cut about dwellings; and near-by pools should be oiled with crude petroleum, or better drained or filled.

#### YELLOW FEVER

Yellow fever is a disease of the seacoast in tropical and subtropical countries characterized by fever, jaundice, and vomiting (in severe cases of blood), and caused by a special germ communicated to man solely through the agency of bites of a special mosquito—*Stegomyia fasciata*. The special germ has not, however, been isolated.

Yellow fever has always been present in Havana, Cuba, Vera Cruz, and other Spanish-American ports; also on the west coast of Africa.

It is frequently epidemic in the tropical seaports of the Atlantic, in North and South America, and Africa. There have been in the

past numerous epidemics in the southern, and occasional ones in the northern Atlantic seacoast cities of the United States. The last epidemic was small and occurred in 1899, in the Soldiers' Home in Hampton, Va.

Rarely has the disease been introduced into France, Great Britain, and other parts of Europe, and it has never spread there except in Spanish ports.

The disease is one requiring warm weather, for a temperature under 75° F. is unsuitable to the growth of the mosquito harboring the yellow fever germ. The germ does not live long in the patient, and he can communicate the disease to mosquitoes for only three days.

Yellow fever prevails in crowded and unsanitary parts of seacoast cities, to which it is brought on vessels by contaminated mosquitoes or yellow fever patients from the tropics. It is then a ship disease.

Havana has always been the source of infection for the United States, but since the disease has been eradicated through the work of Dr. Walter Reed and associates of the American Army of Occupation, that danger has been removed. Yellow fever is not at all contagious in the sense that a healthy person can contract the disease by contact with a yellow fever patient, or with his discharges from the stomach, bowels, or elsewhere, and it is only communicated to man by the bite of the particular kind of mosquito harboring the yellow fever germ in its body.

Both these facts have been incontestably proved by brave volunteers (Dr. R. P. Cooke and two privates), under the command of Major Walter Reed, U. S. A., who submitted to sleep for twenty-one days on clothes soiled by the discharges from patients dying of yellow fever, and escaped the disease. While others, living in uncontaminated surroundings, permitted themselves to be bitten by infected mosquitoes and promptly developed yellow fever. Dr. James Carroll recovered from a severe attack, but Dr. J. W. Lazear died from the inoculation. These martyrs to science gave to mankind the greatest medical discovery ever made in America, save that of ether anesthesia.



**Development.**—Usually from three to four days elapse after a person has been bitten by an infected mosquito before the development of the first symptoms—from fourteen hours to five days and seventeen hours, more precisely.

A period of two weeks must pass after the appearance of a single first case in a region before the next arises. This follows because a mosquito, after biting a patient, cannot convey the germ to another person for a period of twelve days, and two or three days more will be required before the patient will suffer any ill effects.

**Symptoms.**—During the night or morning the patient has a chill or feels chilly, and has discomfort and tenderness in the stomach, with sometimes nausea and vomiting. There is pain in the forehead and eyes, and often in the back and legs. The face is flushed, the eyes bloodshot and perhaps slightly yellow, the eyelids and lips somewhat swollen, and the expression is a mixture of pain, restlessness, and confusion, suggesting intoxication.

The whites of the eyes and skin may become tinged with yellow within thirty-six hours, but usually this is not marked until the third to the fifth day. This jaundice is one of the distinguishing features of the disease, but is often absent in children and in fifty per cent. of cases which recover. The presence of albumin in the urine is another important point. This occurs from the first to the third day usually. Boiling the urine in a glass tube causes the formation of a white cloudiness due to albumin.

The pulse is another peculiar feature of the disease. In the beginning the pulse ranges from 100 to 130, while the temperature varies from 101° to 104° or 105° F. The fever continues for several days—except in mild cases—but the pulse falls. For instance, on the third day the temperature may rise a degree, to 103° F., while the pulse falls ten to twenty beats or so at this time, and may even be normal—between 70 and 80.

In some cases after the second day the patient appears to improve, and the pains and fever lessen. This is called the deceptive stage and, after a day or two, the patient becomes worse again—vomits blood, and bleeds from the nose, gums, tongue, throat, bowels,



womb—and has hiccough, pain, and tenderness in the stomach, and marked jaundice.

The dreaded “black vomit” more often begins with increased vomiting on the fourth to the sixth day. This presents the appearance of coffee grounds or is like ink. The substance vomited is altered blood from the stomach, and the same may be seen issuing from the bowels.

While a serious sign, it does not by any means presage a fatal ending. The action of the kidneys is usually suppressed and the urine scanty. It is extremely important to pay regard to this feature because failure of the patient to pass a proper amount of urine (a quart or more in twenty-four hours) calls for prompt action to avert fatal poisoning from retained waste matter in the blood.

The course of the disease varies greatly. In children—especially of the Creoles—it is frequently so mild as to pass unnoticed. It is probable that most of the immunes in affected regions are those who have previously had exceedingly mild attacks. In adults the fever may last only a few hours or two or three days, with gradual recovery from the various symptoms—yellowness of the skin lasting some time. This is not seen readily during the stage of fever when the surface is reddened, but at that time may be detected by pressure on the skin for a moment, when the skin will present a yellow hue on removing the finger before the blood returns.

Then in others, following abatement of symptoms for two or three days, fever again returns with vomiting or black vomit, and death occurs from suppression of urine with delirium, convulsions, or stupor, or the patient may begin to recover again after a few days. Relapses and various complications are frequent.

Mild fever, slight jaundice, and absence of bleeding are favorable signs; black vomit, high fever, and passage of little urine are unfavorable. The death rate is very variable in different epidemics and among different classes: anywhere from 10 to 85 per cent. The better results occur in private practice among the well-to-do classes. The subjects of alcoholism or poverty are apt to succumb.

**Diagnosis.**—The essential features of yellow fever are the

flushed, seemingly semi-intoxicated appearance, the jaundice, the albumin in the urine, vomiting, black vomit, tenderness over the stomach, the slowing pulse, and bleeding from bowels or mouth.

**Prevention.**—Yellow fever, like malaria, is a preventable disease, and will—in a not remote day—be only a matter of historic interest.

Colonel W. C. Gorgas, U. S. A., following in the footsteps of Major Reed (who demonstrated the mosquito the cause of yellow fever in Havana, in 1900), succeeded in 1901 in ridding Havana of these pests and of yellow fever.

Havana, a city of 250,000, with 6,000 births and 20,000 susceptible persons coming in every year, had been a hotbed of yellow fever continuously for one hundred and thirty years. From 500 to 1,600 persons had died of it each year in that city. Colonel Gorgas, by screening patients, so that they could not be bitten by mosquitoes, by killing infected mosquitoes, and by destroying the breeding places of the *Stegomyia* mosquitoes by the screening of water barrels and other receptacles and treating drains, sewers, etc., with kerosene, succeeded in eradicating yellow fever from Havana so that the last case occurred in September, 1901, with not a single case in the following year. The city has been free from the disease since, except for a slight return.

The Americans occupied the Canal Zone in 1904, and it took sixteen months to abolish the disease there, and it has not reappeared.

When a new case is brought to a community, spread of the disease is prevented by keeping mosquitoes away from the patient (living or dead), while personal freedom from yellow fever may be secured by avoiding mosquito bites through protection by screens indoors, by remaining indoors after the sun has gone down, and by the use of oil of pennyroyal or spirit of camphor on exposed parts of the face, hands, and ankles while outdoors.

**Treatment.**—There is, unfortunately, no special cure known for yellow fever such as we possess in malaria. The patient should be well covered and surrounded with hot water bags during the chilly period.

Hot mustard foot baths give much relief in headache, and both

the bath and patient should be surrounded by blankets. It is advisable to give a good purge the first day, but not after the second day. A single dose of ten grains of calomel for an adult, followed in ten hours by a tablespoonful of Epsom salts in a glass of water; or four tablespoonfuls of castor oil, may be taken. To relieve the headache and pains twenty grains of sodium salicylate in capsules, followed by a glass of water, may be given every three hours for three or four doses. The drinking of much water is imperative, and Sternberg found that a solution of one hundred and fifty grains of sodium bicarbonate (ordinary cooking or baking soda) in a quart of water is of great value if taken to the amount of three tablespoonfuls every one-half hour. Charged, cold Vichy water may be used in place of this.

Vomiting may be allayed by giving only cracked ice by the mouth with a tablespoonful of iced champagne once in half an hour, or by giving a single tablet of one-fourth grain of cocain once in two or three hours. When the patient cannot take water freely, on account of vomiting, a pint of warm water containing a level teaspoonful of salt should be injected slowly into the bowel night and morning, so as to be retained and absorbed, to increase the action of the kidneys.

A mustard paste (made by mixing one part mustard and three parts of flour with warm water) spread between two layers of soft cotton, as big as the hand, applied over the stomach, will also aid in arresting vomiting.

If there is much tenderness and pain in the stomach, mustard foot baths (one tablespoonful to the gallon) are also advised. Cold sponging, packs or baths are best for fever. (*See Typhoid Fever.*) The bowels should be moved daily by injection of warm soapsuds. The patient should not rise from bed, but use a bedpan. No food whatever should be given the first two days, only when the appetite is returning, and any indiscretion in diet may cause a relapse of the disease, as in typhoid fever. The diet should consist of milk, diluted with an equal amount of carbonated Vichy water, or with plain water, broths, and gruels, and only soft food, as cereals, milk toast or soft egg, should be given until ten days after cessation of

the fever. Iced champagne, as advised above, or two teaspoonful doses of whisky in a little ice water at frequent intervals, aid in supporting the strength.

The black vomit may be arrested by one-fourth teaspoonful doses of tincture of chlorid of iron in four tablespoonfuls of ice water every hour after vomiting.



## CHAPTER X

### THE NOSE, MOUTH, AND THROAT

Nosebleed. Cold in the head. Foreign bodies in the nose and throat. Sore mouth or stomatitis. Canker, smoker's tongue, white patches in the mouth. Foul breath. Diseases caused by enlarged tonsils. Inflammation of the gums and decayed teeth. Ulcerated teeth. Toothache. Mouth breathing, including enlarged tonsils, adenoids, and nasal obstructions. Tonsillitis. Quinsy. Diphtheria. Laryngitis. Croup.

#### NOSEBLEED

Nosebleed is caused by blows or falls, or more frequently by picking and violently blowing the nose. The cartilage of the nasal septum, or partition which divides the two nostrils, very often becomes sore in spots, owing to irritation of dust-laden air, and these crust over and lead to itching. Then "picking the nose" removes the crusts, and frequent nosebleed results. These scabs or crusts can usually be prevented from forming by keeping carbolized vaselin in the nose.

Nosebleed also is common in both full-blooded and anemic persons; in the former because of the high pressure within the blood vessels, in the latter owing to the thin walls of the arteries and capillaries which readily rupture.

Nosebleed may be a warning, a remedy, or a disease. It may be a warning in conditions of high blood pressure, as in those past middle age with hardening of the arteries, and in those having disease of the kidneys, heart, liver, and lungs. It may be a remedy in threatened apoplexy from high blood pressure by lowering the pressure through the escape of blood. Nosebleed is a disease, or rather a sign of disease, when due to growths or ulcerations in the nose, or conditions noted above, to disease of the blood fol-

lowing typhoid fever and eruptive fevers, and when occurring in families of "bleeders."

The bleeding comes from one nostril only, and is a general oozing from the mucous membrane, or more commonly flows from one spot on the septum near the nostril, the cause of which we have just noted. The blood may spout forth in a stream, as after a blow, or trickle away drop by drop, but is rarely dangerous except in infants and aged persons with weak blood vessels. The usual position assumed by the person with nosebleed is that of stooping over a basin—the worst position possible. This prevents blood from returning to the heart by compression of veins in the neck. The patient should sit with the head absolutely erect and hold a bowl under the chin to catch the blood. Clothing about the neck should be loosened.

If the nosebleed comes on at night during sleep, the blood may flow into the stomach without the patient's knowledge, and on being vomited may suggest bleeding from the stomach.

**Treatment.**—The avoidance of excitement and of blowing the nose, hawking, and coughing will assist recovery. There is no cause for alarm in most cases, because the more blood lost the more readily does the remainder clot and stop bleeding. As the blood generally comes from the lower part of the partition separating the nostrils, the finger should be introduced into the bleeding nostril and pressure made against this point, or the whole lower part of the nose may be simply compressed between the thumb and forefinger. If this does not suffice a lump of ice may be held against the side of the bleeding nostril, and another placed in the mouth. The injection into the nostril of ice water containing a little salt is sometimes very serviceable in stopping nosebleed. Blowing the nose must be avoided for some time after the bleeding ceases.

If none of these methods arrest the bleeding the nostril must be plugged. A piece of clean cotton cloth, about five inches square, should be pushed gently but firmly into the nostril with a slender cylinder of wood about as large as a slate pencil and blunt at the end. This substitute for a probe should be pressed against the center of the cloth, which folds about the stick like a closed umbrella,

and the cotton pressed into the nostril in a backward and slightly downward direction, for three inches, while the head is held erect. Then pledgets of cotton wool are packed into the bag formed by the cotton cloth after the stick is withdrawn. The mouth of the bag is left projecting slightly from the nostril, so that the whole can be withdrawn in twenty-four hours; or strips of soft cotton, linen or cheese cloth may be pushed into the nostril until they plug it up, leaving the ends hanging for removal. It is best to saturate all the material for plugging the nostril with hydrogen peroxid, if it is at hand, for this better than any other remedy causes the blood to stop, by making a large, firm clot in the nose. If the blood begins to show through the plug the end of the latter should be wet with Monsel's solution to clot the blood.

The bleeding nostril may be more readily plugged by simply pressing into it little pledgets of cotton with a slender stick, but it would be impossible for an unskilled person to get them out again, and a physician should withdraw them within forty-eight hours. Occasionally when plugging the nostril does not stop the nosebleed, it is necessary for a doctor to plug the nose from behind in the throat.

#### COLD IN THE HEAD

**Causes.**—As in many other germ diseases, there is a predisposing cause and a true cause. Thus one of the commonest predisposing causes of colds is prolonged exposure to cold or wet, especially when the body is overheated. This chilling of the surface of the skin leads to congestion in the nose, the blood vessels dilate and become paralyzed, and the secretions are altered. It is at this stage that the altered secretions offer a suitable medium for the growth of germs—the true cause—and the cold becomes a germ disease unless dissipated at the start.

The germs most often responsible for colds are those causing inflammation in wounds (*streptococci* and *staphylococci*), and one or two others, while, if the cold becomes chronic, the germs of pneumonia are practically always present in the discharge. The germs of certain special diseases are found in the nose of patients, and in these disorders cold in the head is often the first symptom

to be noted, as is the case in measles, influenza, and in cerebrospinal meningitis.

Colds are contagious and therefore healthy persons, especially children, should not sleep in the same room or be closely associated with patients suffering from head colds. In some institutions for children, tradespeople are not permitted to enter the house in order to avoid the introduction of colds.

Among the predisposing causes, other than exposure to cold, are the following: The wearing of overwarm underclothing indoors in cold weather is a prolific cause of colds, while on the other hand, the taking of a daily cold bath in a very warm room, on rising, is one of the best preventives of colds. The wearing of extra clothing on the chest is not preventive of colds—quite the contrary.

The best place for a chest protector is on the soles of the feet, which means that the feet cannot be kept too dry and warm in cold weather.

The dry heat of houses in winter is provocative of colds in drying the nose and throat and preventing the normal discharges from washing away dust and germs, and in causing irritation of the nasal mucous membrane by dried secretion and crusts. The evaporation of water into the house should be provided for in connection with all modern heating apparatus. In fact, moisture in the air is of as much importance as fresh air. Recent research has shown that good ventilation does not mean rapid removal of waste products and expired air: it shows that air becomes oppressive when too hot, dry, and still. Ventilation means sufficient coolness, moisture and motion of the air. The same air that seems unfit for breathing will become respirable if the temperature is lowered and the air kept in motion by fans, without the introduction of fresh air.

Dust favors colds, especially in houses and cities, in being germ-laden and irritating. Various chronic diseases are responsible for frequent colds, as chronic catarrh, obstruction from deformities of the partition between the nostrils, polypi, and—the most common cause of all in children—adenoid growths. Any lowering of the general vitality predisposes to colds.

The prevention of colds naturally means the removal of the sev-



eral causes noted. Colds might be included among the infectious diseases, as measles, etc., but they differ from these, however, in not being due to a special germ but to one of several special germs. They may be epidemic and occur more often in spring and fall when changes in weather are most marked.

**Symptoms.**—Colds often start with a feeling of dryness and soreness in the upper and back part of the throat for a day or so before the nose grows dry and sneezing begins, with swelling of the mucous membrane and fullness and obstruction in the nose. The discharge from the nose is first watery, but after two days it becomes thick. There may be severe pain in the forehead and in the upper front teeth.

Chilliness, pain in the lower part of the back and legs, fever ( $101^{\circ}$ - $102^{\circ}$  F.), with malaise and loss of appetite may form a part of severe colds. Obstruction in the nostrils may make breathing difficult—a serious matter in infants, especially if nursing. A cold will last from two to three days to as many weeks. If frequently repeated, a chronic nasal catarrh may result.

While complete recovery from acute colds is the rule, yet certain complications threaten. Extension of the cold, or infection, downward into the throat leads to laryngitis with hoarseness; extension into the bronchial tubes and air cells of the lungs means bronchitis or pneumonia. Even more common are complications in the head, as extension of the inflammation up the eustachian tubes which lead, one from either middle ear to either side of the upper part of the throat—back of the nasal passages. This may eventuate in abscess of one or both ears, rupture of the ear drums, and escape of pus.

Again, extension of the inflammation into the numerous air cavities of the head (sinuses) connected with the nasal passages gives rise to what is known as sinusitis. In this, persistent and severe headache in and about the eyes or forehead, and even nausea and vomiting, may occur. The pain grows worse on stooping (increase of blood in the head), and there may be some tenderness on pressing the points marked in Figure 55 at and over the site of the frontal sinuses. Abscess of the frontal sinus is rare, as the

inflammatory secretions usually drain through the natural passages connecting with the nose.

Acute inflammation in the cavities inside the bones of the face (antrum) may be caused by a cold in the head, and abscess may result from closing of the natural opening from the antrum into the nose and retention of secretion.

There is then neuralgia of the side of the face and head, tenderness over the antrum, and often pain in chewing, as the first and second back teeth have fangs reaching up into the antrum. More commonly, inflammation and abscess of the antrum are caused by closure of the opening into the nose through chronic catarrh, or inflammation extending from decay of the teeth mentioned, and antrum disease is then a slow chronic process.

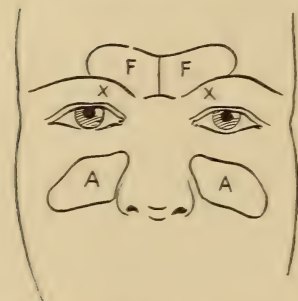


FIG. 55.—F. SITE OF FRONTAL SINUS. A. SITE OF ANTRA OF HIGHMORE. Pressure on the skin over these points may show tenderness in inflammation (Sinusitis) in these cavities in the skull.

**Treatment.**—Severe, persistent headache in colds suggest sinusitis. To arrest a cold in the head the writer has found nothing so successful as a 12 per cent.

freshly made solution of argyrol. The patient, on the first suggestion of cold in the head or throat, should hold the head well back and drop a medicine dropperful of this solution slowly into each nostril twice daily. If the head is held back a minute or two the solution will not run out of the nose but down the throat, when it may be swallowed, as it is harmless for adult or infant. One or two such applications will often cure a beginning cold. When the solution can be given by an attendant it is better for the patient to lie flat on his back and have the solution dropped into the nose by the attendant. The solution stains badly, and clean old cotton cloths should be used for handkerchiefs. The stains on clothing may instantly be removed by soaking in a solution made by dissolving a corrosive sublimate tablet in half a pint of water.

In addition to this, the patient should take a warm bath, and drink two or more glasses of hot lemonade before going to bed, and

move the bowels the following morning with a Seidlitz powder, or a tablespoonful of Epsom salts in a tumbler of water on rising. Even if the cold is not treated in the beginning it is still well to try the argyrol solution a few times.

If the cold is severe, the patient will recover more quickly, and the danger of complications will be minimized, by staying in bed. The internal use of drugs is of little value unless the patient remains in bed. Then the following prescription may be taken, especially if there is much headache.

Phenacetin .....	10 grains
Sodium salicylate .....	30 "
Monobromated camphor.....	6 "

Mix and make six capsules.

One of these capsules should be taken hourly as long as they last. If the secretion is profuse and the nose is obstructed the nasal passages should be sprayed night and morning with a solution made from Seiler's tablets, by dissolving one in an atomizer two-thirds full of hot water. The solution should be used as hot as can be readily borne. A coarse spray is best, so that the entire contents of the atomizer may be used each time. By enlarging the opening in the hard rubber tip of the atomizer with a red-hot needle this may be accomplished.

Then every three hours a medicine dropperful of the following solution should be dropped into each nostril with the head thrown back.

Iodin .....	2 grains
Menthol .....	30 "
Camphor .....	30 "
Albolene .....	2 ounces

Mix. Drop into nostrils as directed.

Should the cold become chronic, or colds become frequent, it is probable that some condition exists in the nose which can best be treated locally by a doctor.

The following tonic is useful in persistent colds:



Quinin sulphate.....	45 grains
Reduced iron.....	1 drachm
Strychnin sulphate.....	1 grain
Arsenic trioxid .....	½ grain
Mix and make 30 pills.	
Directions: One pill three times daily after meals.	

The treatment of infants with colds consists in the giving of one teaspoonful of castor oil at the onset and keeping the child outdoors as much as possible, unless the child has fever or the weather is very inclement. If there is fever the child should be kept in bed, and five to ten drops of sweet spirit of niter should be given in a teaspoonful of sweetened water every three hours. At the beginning of the cold ten drops of the argyrol solution, noted above, should be dropped into the nostrils twice, about twelve hours apart, and after this a solution of boric acid, sixteen grains, in one ounce of albolene, should be dropped into the nostrils every three hours, using about one-half a dropperful in each nostril.

To prevent colds in infants a washcloth should be wrung out in cold water and the skin of the back and chest, down to the waist, should be rubbed briskly with it each morning, followed by a dry rub.

#### FOREIGN BODIES IN THE NOSE

Children often put foreign bodies, as shoe buttons, beans, and pebbles, in their noses. They may not tell of it, and the most conspicuous symptoms are the appearance of a thick discharge from one nostril, having a bad odor, and some obstruction to breathing on the same side. If the foreign body can be seen, the nostril on the unobstructed side should be closed and the child made to blow out of the other one. If blowing does not remove the body sneezing may—by making the patient inhale snuff through the other nostril, or by tickling it.

#### FOREIGN BODIES IN THE THROAT

These may arise from food, as fish bones, particles of meat, or hard bodies, such as pins, marbles, coins, needles, toothpicks, and false teeth, may be held in the mouth and be drawn in with the



breath. If the foreign body cannot be removed with the finger in the mouth and is obstructing the breathing, the patient should be turned upside down and be slapped on the back. If there is great difficulty in breathing, artificial respiration should be performed until a doctor arrives.

### SORE MOUTH—INFLAMMATION OF THE MOUTH

(*Stomatitis*)

There are various forms of inflammation of the mouth, generally dependent upon the entrance of germs, associated with indigestion, teething, or general weakness following some fever or other disease.

Unclean nipples of the mother, or unclean bottles allow entrance of germs, and are frequent causes in infants. Irritation of a sharp tooth, rubbing the gum, food that is too hot, or too vigorous cleansing of the mouth, may start the disease. Some chemicals, especially mercury, improperly prescribed, produce the disease. The germs may gain admission in some cases in impure milk. Inflammation of the mouth is essentially a children's disease, only the ulcerated form being common in adults.

**Symptoms.**—In general, the mouth is hot, very red, dry, and tender; the child is fretful and has difficulty in nursing, often dropping the nipple and crying; the tongue is coated, and there may be fever and symptoms of indigestion, as vomiting. Sometimes the disease occurs during fevers; later in the course of the disorder the saliva often runs freely from the mouth.

**Simple Form.**—In the simple form there are only redness, swelling, and tenderness of the inside of the mouth. The tongue is at first dry and white, but the white coating comes off, leaving it red in patches. After a while the saliva becomes profuse. There may be lumps under the jaw or swollen glands.

The treatment consists in washing the mouth often in ice water containing about one-half drachm of boric acid to four ounces of water, by means of cotton tied on a stick, and holding lumps of ice in the mouth wrapped in the corner of a handkerchief. It is well also to give a teaspoonful of castor oil.

**Aphthous Form.**—In this there are yellow-white spots or little blisters, surrounded by a red zone, which break and leave little depressions or ulcers, on the inside of the cheeks and lips, and on the tongue and roof of the mouth. These occur in crops and last from ten to fourteen days. The disease is often preceded by vomiting, constipation, and fever, with pain in the mouth and throat, and is accompanied by lumps or swelling of the glands under the jaw and in the neck.

The treatment consists in the use of castor oil, and swabbing the mouth several times a day, after each feeding, with boric acid solution, as advised before, or better with permanganate of potash solution, using ten grains to the cup of water. One should be careful not to rub off the tender membrane. If any raw spots appear in the mouth, from the running together of several blisters, they should be touched with a five per cent. solution of silver nitrate with a pledget of absorbent cotton wound on a toothpick.

**Thrush (*Sprue*).**—This form is due to the growth of a special fungus (like that of yeast) in the mouth, occurring as white spots on the inside of the cheeks, lips, tongue, and roof of the mouth, looking like flakes of curdled milk. There are also symptoms of indigestion, as vomiting, diarrhea, and colic. The disease is contagious. Sometimes ulcers or sore depressions are left in the mouth, and in weak children—in whom the disease is apt to occur—the result may be serious, and a physician's services are demanded.

The treatment consists in applying saleratus and water (one teaspoonful in a cup of water) to the whole inside of the mouth, between feedings, with a camel's-hair brush or with a soft cloth. A dose of castor oil is also desirable, and great care regarding cleanliness of the mouth and sterilizing of the bottles and nipples should be exercised.

**Ulcerous Form.**—This form does occur in children, but may attack persons of all ages. It is often seen following measles and scarlet fever, and in the poor and ill-nourished, and after the unwise use of calomel. Want of care of the teeth appears to favor the disease, as it occurs in those with decayed teeth and having accumulations of tartar on them. It is sometimes epidemic in

camp, jails, and poorly conducted public institutions. The margins of the gums, where they join the teeth on both the upper and lower jaw, first become red, and swollen, and bleed easily. Then ulcers form on the gums which are covered with a grayish or yellowish white membrane which cannot readily be removed. While the tongue, inside of the cheeks and lips are swollen and painful, they are not usually ulcerated. Matter, or pus, forms between the teeth and the gum, and the mouth has a foul odor. The glands under the jaw and in the neck are enlarged, feeling like tender lumps, saliva flows freely and chewing becomes very painful. In severe cases the gums may become destroyed and eaten away by the ulceration, and the bone of the jaw be diseased and exposed.

In the graver cases, it may become necessary to remove dead bone and teeth, and the very dangerous form next described may sometimes follow. It will be seen that it is a disease requiring skilled medical attention. The treatment consists in using, as a mouth wash and gargle, Dobell's or Seiler's Solution, or a solution of chlorate of potash (fifteen grains to the ounce) every two hours. Cases usually last at least a week. Potassium chlorate is very successful in curing the disease when given internally: three grains for a child of two, ten grains for a child of twelve, and twenty grains for adults, in plenty of water three times daily.

**Gangrenous Form** (*Noma*).—This is a rare and fatal form of inflammation of the mouth, and occurs in children weak and debilitated from other diseases, as from the contagious eruptive fevers, chronic diarrhea, and scurvy. It is seen more often in hospitals and is contagious. A foul odor is noticed about the mouth, in which an ulcer on the gum or inside of the cheek will be seen. The cheek swells tremendously, with or without pain, and becomes variously discolored—red, purple, black.

The larger proportion of patients die of exhaustion and blood poisoning within one to three weeks, and the only hope is through surgical interference at the earliest possible moment.



**CANKER**

A canker is a small, shallow, yellow ulcer, appearing on the inside of the lips or beneath the tongue during some disorder of the digestion. It is very tender when touched, and renders chewing or talking somewhat painful.

**Treatment.**—The treatment consists in touching the ulcer carefully with the point of a wooden toothpick which has been dipped in pure carbolic acid (a poison), and then rinsing the resulting white spot and the whole mouth very carefully with water, so as not to swallow any of the acid.

**SMOKER'S TONGUE**

(*Leukoplakia*)

This disorder consists of ivory or bluish-white, slightly raised patches (or small white spots) upon the upper surface or sides of the tongue. Occasionally these white patches are seen on the sides of the cheeks, roof of the mouth, gums, and inside of the lips, while the tongue is free. The patches are permanent, usually give rise to no sensation, and cannot be easily scraped off. They may interfere with chewing and speaking.

While the disease occurs most often in heavy smokers, it also is observed in others. Temporary white patches are seen on the tonsils and palate and back of the mouth, cheeks, and tongue in diphtheria and in syphilis. When no fever is present, such a condition would suggest syphilis. In smoker's tongue the chief ultimate danger is of ulceration and cancer.

**Treatment.**—The treatment is rather unsatisfactory and should be undertaken by an expert skin specialist. Hot food and smoking are to be forbidden. Sharp teeth should be put in order.

**FOUL BREATH**

This is a general disease, often occurring as a result of chronic disorders of the mouth and throat, as chronic tonsillitis, and inflammation of the gums or Riggs' disease, or decayed teeth.

To test for the presence of the first two diseases one may rub



firmly on the tonsils with the tip of the finger and smell the finger; in the case of Riggs' disease, one may draw a thread up between the teeth and then under the edge of the gums in various places and then smell the thread. A foul odor in either case would indicate the presence of disease. Such conditions are accompanied by the presence of putrefactive and pus-forming germs which, with their poisons, may enter the blood and produce the most grave disorders. The medical authorities of the world regard poisoning from chronic mouth disorders as having the most far-reaching consequences.

Thus, chronic rheumatism, appendicitis, gall-bladder inflammation, pleurisy, diseases of the kidney, heart, nervous system, and fatal anemias, are all thought to be caused by chronic inflammation of the gums and tonsils. (See Chronic Rheumatism.)

Foul breath frequently arises from other causes, as indigestion and inflammation of the mouth (stomatitis), while many diseases of the nose occasion it.

Osler warns us that most persons of middle age or over have a certain amount of inflammation of the gums (Riggs' disease or pyorrhea alveolaris) and that every one should go to the dentist once a month for cleaning of the teeth, removal of tartar, and prevention of pus pockets in the gums; also that one should not hesitate to speak to friends who have a disagreeable breath and point out to them its significance. The brushing of the teeth at bedtime and after breakfast, and the use of an antiseptic mouthwash afterwards (Dobell's or Seiler's solution, to be had in tablet form, or glycothymol), are also of much value. For special treatment of chronic tonsillitis and Riggs' disease, *see* special chapters under these headings.

### MILD SORE THROAT

#### (*Acute Pharyngitis*)

The milder sore throat is commonly the beginning of an ordinary cold, although sometimes it is caused by digestive disorders, gout, and foreign bodies in the throat. Exposure to cold and wet is, however, the most frequent source of this form of sore throat.

Soreness, dryness, and tickling first call attention to the trouble,

together with a feeling of chilliness and, at times, slight fever. There may be some stiffness and soreness about the neck, owing to swelling of the glands. If the tongue is held down by a spoon handle, the throat will be seen to be generally reddened, including the back, the bands at the side forming the entrance to the throat at the back of the mouth, and the uvula or small, soft body hanging down from the middle of the soft palate at the very back of the roof of the mouth. The tonsils are not large and red nor covered with white dots, nor is the fever high, as in tonsillitis. The throat may be so sore as to be intensely painful, especially during swallowing. The voice is husky and there is a feeling as if there were a foreign body in the back of the throat, which keeps the patient continually hawking and spitting. The surface of the throat is first dry and glistening, and streaked with stringy, sticky mucus.

**Treatment.**—The disorder rarely lasts more than a few days. The bowels should be moved in the beginning of the attack by some purgative—as two compound cathartic pills or three grains of calomel—and a spray from an atomizer containing Seiler's or Dobell's solution, or simply warm water in which one teaspoonful of saleratus to the cupful is dissolved, should be used frequently.

Troches, each containing one and one-half grains of guaiac and one-fourth grain of tannic acid, are also very useful. One should be dissolved in the mouth hourly. Gargles are not so efficient as the spray from an atomizer. The sucking of gelatin lozenges (zymol) and hoarhound and lemon drops will afford some relief. Smoking must be discontinued while the throat is sore.

#### ULCERATED TOOTH

(*Alveolar Abscess*)

An ulcerated tooth means inflammation of the root of a tooth with the formation of matter or pus between the root and the bone in which it is placed—in other words the socket. The pain is intense because the pus is confined under pressure in this unyielding cavity of the bony socket. There may be no cavity in the tooth, but the tooth is commonly dead or the nerve is dying, and the tooth is frequently darker in color.

How shall we determine which is the ulcerating tooth if there is severe toothache? A severe, persistent pain in a single tooth which has no cavity means an ulcerated tooth in most cases. The pain is not always felt in the one tooth but may seem to be in several. By tapping the various teeth in turn with a piece of metal, as the handle of a table knife, special soreness will be found in the ulcerated tooth. Then there will usually be swelling about the gum nearest the affected tooth, and often in biting, pain will be felt in the diseased tooth because it projects lower than its fellows.

**Results of Alveolar Abscess.**—If the inflammation develops into abscess and formation of pus in the socket of the tooth, various results are likely to occur. The face swells as well as the gum, the swelling in the face being most in the region of the diseased tooth.

The pus may escape into the mouth alongside of the tooth, with relief of pain, and only some soreness of the tooth and slight swelling of the gum may remain. If this does not occur, besides the swelling of the face, there may also be swelling of the gland, as a lump under the back of the lower jaw, from an ulcerated tooth in either the upper or lower jaw.

Another common course is for the pus to break out through the gum near the ulcerated tooth with relief from pain, but a little hole in the gum may remain, discharging pus at times and connected with the decayed tooth. This gets stopped on occasions and abscess may recur. The hole or sinus is usually on the outer side of the tooth and perhaps one-quarter of an inch distant from it. Then, if the abscess goes on without interference, it may break out on the cheek, or beneath the jaw through the skin, leaving a bad scar; sometimes the glandular lump under the jaw becomes so inflamed that abscess forms in it. If the abscess about the tooth is left to itself too long, there may be sufficient inflammation to cause death of a small area of the jawbone about the tooth socket. Then, even though escape of pus gives relief from pain, there will remain some swelling of the gum about the tooth and a hole in the gum discharging pus indefinitely.

Such a chronic inflammation may rarely give rise to a malignant



tumor from constant irritation. Abscess of the first two upper back teeth may involve the antrum.

**Treatment.**—In threatened abscess of a tooth, that is in severe toothache where there is no cavity in the tooth, one may secure relief sometimes by painting the gum about the diseased tooth with tincture of iodine on a camel's hair brush, or by applying a toothache plaster (sold by all druggists) to the gum, about once an hour. Then the patient may lie with the painful side of the face on an ice bag. The pain may subside, owing to the fact that the trouble has been only congestion, or to the unnoticed escape of pus through a minute opening in the gum.

If, however, the inflammation continues, the pain becomes intense and throbbing, and rest and sleep impossible, there may be fever and chills from a slight degree of blood poisoning.

The dentist is, of course, the proper person to consult in all cases of toothache. The tooth should be treated at once by removal of the filling, if there is one, and by the use of a local anesthetic, cleaning out, and disinfecting its cavity. Filling is postponed until the soreness about the tooth disappears, or until the nerve is killed, etc. The immediate removal of the tooth will give the most instantaneous and effective relief and prevent the complications noted above, by affording free escape of the pus.

Many dentists refuse to pull an ulcerated tooth but tell the patient to return when the trouble has subsided. This is bad advice, and there is not the slightest objection to extracting an ulcerated tooth except the loss of the tooth. But when the tooth is not worth saving, or when there are signs of blood poisoning, as shown by chills and fever, or when there is danger of abscess in the face, as evidenced by much swelling, it is wiser to have the tooth extracted to afford free drainage for the pus. There is no excuse for the dentist who refuses to extract an ulcerated tooth instantly, unless he can relieve the trouble by opening up the root of the tooth. It may be necessary to open the gum, as well as to extract the tooth, when there is much pus in the gum.

If the patient is desirous of saving the tooth and there is no danger of blood poisoning or abscess in the face or neck, he may



stay in bed with an ice bag on the face and take ten drops of laudanum<sup>1</sup> in water at intervals of three hours; or better, he may be given a subcutaneous injection of morphin by a doctor. Then the gum should be lanced as soon as swelling there shows the presence of pus. This latter advice applies to cases where the patient has not seen a dentist early enough to relieve the trouble by treating the tooth.

#### TOOTHACHE FROM DECAY AND CAVITY

When there is a cavity in an aching tooth it should be cleaned of food with a toothpick and, if it can be managed, it is also well to wipe the cavity dry with a wisp of absorbent cotton wound on the end of a moistened toothpick.

The cavity may be most conveniently filled with one of the so-called toothache gums sold by all druggists. These contain some creosote and oil of cloves usually, and the gum may be inserted in the cavity with a toothpick and the fingers. Otherwise one may loosely pack the cavity with a small piece of absorbent cotton rolled between the fingers and saturated with creosote or oil of cloves, preferably the latter. If creosote is used one must be careful to squeeze any excess of the fluid out of the cotton before introducing it into the tooth or it will burn the mouth. (For care of the teeth, see Part II, Chapter II.)

#### MOUTH BREATHING—INCLUDING ADENOIDS, CHRONIC TONSILLITIS, DEVIATION OF THE NASAL SEPTUM, ENLARGED TURBINATES, AND POLYPI

ADENOIDS.—Any obstruction in the nose causes mouth breathing, and gives rise to one or more of a long train of unfortunate results. Among the disorders producing mouth breathing, enlargement of the glandular tissue in the back of the nose and throat of children is most important. Glandular growths in the upper part of the throat opposite the back of the nasal cavities are known as “adenoids”; they often completely block the air passage at this point, so that breathing through the nose becomes difficult.

ENLARGED TONSILS.—Associated with this condition we usually

<sup>1</sup>Laudanum is a powerful drug (opium) and can only be bought on a doctor's prescription.

see enlargement of the tonsils—two projecting bodies, one on either side of the entrance to the throat at the back of the mouth. In healthy throats the tonsils should not be visible. The tonsils are situated between two folds of membrane or pillars, as they are called, the more forward ones forming narrow curtains at either side of the back of the mouth, partitioning it to a slight extent from the throat behind.

We are unable to see adenoids because of their position, but we can be reasonably sure of their presence in children when we find the signs and symptoms resulting from mouth breathing, as described below. When the tonsils are enlarged in children the existence of adenoid growths also is practically certain.

The surgeon assures himself positively of the existence of adenoids by inserting a forefinger into the mouth of the patient and hooking it up back of the roof of the mouth, when they may be felt as a soft mass filling the back of the nose passages.

Other less common causes of mouth breathing, seen in adults as well as in children, are deviation of the nasal septum, swelling of the mucous membrane covering certain bones in the nose (turbinates), and polypi.

DEVIATION OF THE NASAL SEPTUM.—Deviation of the nasal septum means displacement of the partition dividing the two nostrils, so that more or less obstruction exists.

This condition may be occasioned by blows on the nose received in the accidents common to childhood. The deformity which results leads in time to further obstruction in the nose because, when air is drawn in through the narrowed passages, a certain degree of vacuum and suction on the walls of the nose is produced, as would occur if we drew in air from a large pair of bellows through a small, thin rubber tube. This induces an overfilling of the blood vessels in the walls of the passages of the nose, and the continued congestion is followed by increased thickness of the lining mucous membrane, thus still further obstructing the entrance of air. A one-sided nasal obstruction in a child, with discharge from that side, leads one to suspect that a foreign body has been put in by the child—such as a shoe button.

**POLYPI.**—Polypi are small pear-shaped growths which form on the membrane lining the nasal passages, and sometimes completely block them. They are soft, red and pulpy, and are apt to bleed easily.

**Causes.**—These, then, are the usual causes of mouth breathing, but of most importance on account of their frequency and bearing on health and development are adenoids and enlarged tonsils in children. Adenoids and enlarged tonsils are often due to inflammation of these glands during the course of the contagious eruptive diseases, as scarlet fever and measles; diphtheria also is a cause. Probably, constant exposure to a germ-laden atmosphere is conducive to enlarged tonsils and adenoids, as they are pretty constant in children herded in tenements.

**Symptoms.**—The mouth breathing is more noticeable during sleep; snoring is common, and the breathing is of a snorting character with prolonged pauses. Children suffering from enlarged tonsils and adenoids are often backward in their studies, look dull, stupid, and even idiotic, are often cross and sullen; the mouth remains open, and the lower lip is rolled down and is prominent; the nose has a pinched aspect, and the roof of the mouth is high. Air drawn into the lungs should be first warmed and moistened by passing through the nose, but when inspired through the mouth, produces so much irritation of the throat and air passages that constant colds, chronic catarrh of the throat, laryngitis, and bronchitis may ensue.

Then the continued irritation of the throat occurring in mouth breathers weakens the natural resistance against such diseases as acute tonsillitis, scarlet fever, and diphtheria, so that they are especially subject to these diseases. But these are not the only ailments to which the mouth breather is liable, for earache and deafness naturally follow the catarrh, owing to the obstruction of the eustachian tubes (*see Earache and Deafness, Part III, Chapter XII*).

Deformity of the chest is another result of obstruction to nose breathing, the common form being the "pigeon breast," where the breast bone is unduly prominent. The voice is altered so that the



patient "talks through his nose," although in reality nasal resonance is reduced and difficulty is experienced in pronouncing the letters *n* and *m* correctly, while stuttering is not an uncommon occurrence.

Nasal obstruction leads to poor general nutrition; hence children with enlarged tonsils and adenoids are often puny and weakly specimens.

While adenoid growths are most common in children, they are not at all rare in adults. The chronically enlarged tonsil is always a diseased tonsil and seriously threatens the general health. Persons with enlarged tonsils are subject to frequent sore throats in the winter months and acute tonsillitis. Enlarged tonsils are the most common cause of swollen glands in the neck in children.

The enlarged tonsil harbors germs, and these produce poisons, and both may continually leak into the blood, setting up infections in distant organs. Thus it has become well recognized that enlarged tonsils are the most common cause of chronic rheumatism and frequently lead to heart and kidney disease and pleurisy, and, not improbably, to gall-bladder troubles and appendicitis. The tonsil which is enlarged should be cut out at the earliest opportunity in adult or child.

**Treatment.**—The treatment is purely surgical in all cases of nasal obstruction. Removal of the adenoid growths, enlarged tonsils and polypi, straightening the displaced septum or removing the hard portion and leaving simply the membranous partition, and cauterizing the thickened mucous membrane obstructing the nasal passages, comprise the various common procedures. None of the operations is dangerous if properly performed and they should be generally done, even in the case of delicate children, as removal of the cause is the means of overcoming this delicacy.

The common operation in children is removal of enlarged tonsils and adenoid growths for which ether is generally given, or sometimes only nitrous oxid gas. In operations on enlarged tonsils one cannot too strongly emphasize the fact that they should be completely removed and not merely amputated in part, as has been hitherto the accepted routine operation. In such cases the trouble may not be



at all improved and may even be made worse. The operation has consequently fallen into disrepute because the tonsils are said to "grow again"—the real fact being that they were never wholly removed.

A tonsil completely removed cannot grow again any more than a finger after its removal. In adults, removal of the tonsils is done under the use of local injection of cocain. There are but comparatively few doctors who do the complete tonsil operation, even at the present time.

The aftertreatment in children is not unimportant, consisting in the use of a simple, generous diet, as plenty of milk, eggs, bread and butter, green vegetables and fresh meat, and the avoidance of pastries, sweets, fried food, pork, salt fish and salt meats, and also the roots, as parsnips, beets and turnips; and tea and coffee.

Life in the open air, emulsion of cod liver oil, daily sponging with cold water while the patient stands in warm water, followed by vigorous rubbing, will all assist the return to health.

#### ACUTE TONSILLITIS

(*Follicular Tonsillitis*)

Tonsillitis is a germ (chiefly streptococci) disease and is contagious. Exposure to cold and wet and to germ-laden air renders persons more liable to attacks. It is more likely to occur in young people, especially those who have already suffered from the disease and whose tonsils are chronically enlarged, and is most prevalent in this country in the spring. The disease is often associated with rheumatism.

Recently it has been found that epidemics of tonsillitis are due to milk. The germs (streptococci) in the milk are either derived from an inflamed cow's udder or from contamination of milk by persons who have the germs in their throats. Thus in Boston in May, 1911, within a few days, 1,048 cases arose from milk, with forty-eight deaths. Boiling or pasteurizing milk (at home) will prevent such outbreaks.

Certain complications may follow tonsillitis, especially in the severe epidemics. These include swelling of the glands of the neck,

joint inflammation, abscess in the ear, heart disease, pneumonia and peritonitis.

**Symptoms.**—Tonsillitis begins much like grippe, with fever ( $102^{\circ}$  to  $105^{\circ}$  F.), headache, backache and pain in the limbs, sore throat, and pain in swallowing. On inspecting the throat (with the tongue held down firmly by a spoon handle and the mouth widely open in a good light, preferably sunlight) the tonsils will be seen to be swollen, much reddened, and dotted over with pearl-white spots.

Sometimes only one tonsil is so affected, but the other is likely to become inflamed also. Occasionally there may be only one white spot on the tonsil. The swelling differs in degree; in some cases, the tonsils may be so swollen as almost to meet, but there is no danger of suffocation from obstruction of the throat, as occurs in diphtheria and very rarely in quinsy. The characteristic appearance, then, consists in large, red tonsils covered with white spots. The spots represent discharge which fills in the depressions in the tonsil. The fever lasts three days to one week generally, and it then subsides together with the other symptoms.

**Diagnosis.**—With apparent tonsillitis there must always be kept in mind the possibility of diphtheria, and, unfortunately, it is at times impossible for the most acute physician to distinguish between these two diseases by the appearance of the throat alone.

In order to do so it is necessary to rub off some of the discharge from the tonsils, and examine, microscopically, the kind of germs contained thereon. The following are the general points of difference: In diphtheria the tonsils are usually completely covered with a gray membrane. In the early stage, or in mild cases of diphtheria, there may be only a spot on one tonsil, but it is apt to be yellow in color, and is thicker than the white spots in tonsillitis. These are the difficult cases. Ordinarily, in diphtheria, not only are the tonsils covered with a grayish membrane, but this soon extends to the surrounding parts of the throat, whereas in tonsillitis the spots are always found on the tonsil alone. The white spot can be readily wiped off with a little absorbent cotton wound on a stick, in the case of tonsillitis, but in diphtheria the membrane can

be removed in this way only with difficulty, and leaves underneath a rough bleeding surface. The breath is apt to have a bad odor in diphtheria, and the temperature is lower (not much over 102° F.) than in tonsillitis, when it is frequently 103° to 105° F.

Notwithstanding these points, it is never safe for a layman to undertake the diagnosis when a physician's services are obtainable. On the other hand, when this is not possible and the patient's tonsils present the white, dotted appearance described, especially if the person has been subject to similar attacks, one may be reasonably sure that the case is one of tonsillitis.

**Treatment.**—The patient should be put to bed and kept apart from children and young persons, and, if living among large numbers of people, should be strictly quarantined. For although tonsillitis is not dangerous, it quickly spreads in institutions, boarding schools, etc. If the tonsils are painted with a solution of silver nitrate (one drachm to the ounce of water), applied carefully with a camel's-hair brush, at the beginning of the attack, with two applications twelve hours apart, the disease may sometimes be arrested. It is well also at the start to open the bowels with calomel, giving three grains in a single dose, or divided doses of one-half grain each until three grains have been taken. The outside of the throat should be kept covered with a wet flannel wrung out in cold water and covered with oil silk, or an icebag for the neck may be conveniently used in its place.

One-half teaspoonful of the following prescription is beneficial unless it disagrees with the stomach. It must not be taken within half an hour before eating, and is not to be diluted with water. It acts, partly through its local effect on the tonsils, when allowed to flow from a spoon on the back of the tongue.

Tincture of chlorid of iron.....	1/2 ounce
Glycerin .....	4 ounces
Mix. Directions: One-half teaspoonful every half hour.	

A mixture of hydrogen dioxid—equal parts with water, can also be used to advantage as a spray in an atomizer every two hours.



The iron preparation and spray should be continued until the throat regains its usual condition.

A liquid diet is desirable during the first part of the attack,

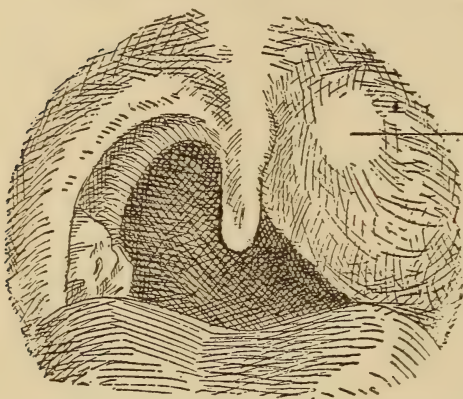


FIG. 56.—QUINSY OR ABSCESS OF THE TONSIL. The point at which the abscess should be opened is shown at *a*.

consisting of milk, cocoa, egg nog (made of the white of egg), soups, and gruels; orange juice may be allowed, also grapes. The bowels must be kept regular with mild remedies, as a Seidlitz powder in a glass of water in the morning, or a one or two grain tablet of extract of cascara sagrada at night.

In persons who have had tonsillitis the tonsils are usually chronically diseased and enlarged. The tonsils should be removed under these circumstances to prevent future attacks of tonsillitis and the train of serious sequelae noted above under Symptoms of Mouth Breathing.

### QUINSY

Quinsy is a peritonsillitis; that is, it is an inflammatory disease of the tissues in which the tonsil is imbedded, an inflammation around the tonsil. The swelling of these tissues thrusts the tonsil out into the throat; but the tonsil itself is little affected. Quinsy involves then the structures surrounding the tonsil, and usually results in abscess.

The disease is said to be frequently hereditary, is more often seen in persons under thirty-five, and often occurs in those subject to rheumatism and gout. It is seen more often in spring and autumn and in those living an out-of-door existence. Having once had quinsy, the victim is liable to frequent recurrences of the disease.

**Causes.**—The causes of quinsy are the same as for tonsillitis. Chronically enlarged and diseased tonsils are the most frequent



cause of quinsy, and their removal will prevent future attacks. To surely prevent quinsy they must, however, be wholly dissected out and not merely have their tops cut off, as was formerly done.

**Symptoms.**—Quinsy is characterized by much greater pain in the throat and in swallowing than is the case in tonsillitis, and the temperature is often higher—sometimes  $104^{\circ}$  to  $105^{\circ}$  F. The disease comes on with headache, backache, and chilly feelings, and patients who have once had quinsy will usually be able to correctly foretell an attack before there is much swelling in the throat. This is the time to begin treatment.

When the disease is advanced and the throat is inspected, one or both tonsils are seen to be enlarged and crowded into the entrance to the throat, from the swelling of the neighboring parts (Fig. 56). The tonsils may indeed almost block the entrance to the throat; the voice is thick and indistinct; the glands in the side of the neck become swollen; there is often earache; and the neck is sore and stiff, while the mouth can be only partially opened on account of pain. For the same reason the patient can swallow neither solid nor liquid food, and sits bent forward, with saliva running out of the mouth. The secretion of saliva is increased, but is not swallowed on account of the pain produced by the act. Sleep is also impossible, and altogether a more piteous spectacle of pain and distress is rarely seen.

Having reached this stage, the inflammation usually goes on to abscess (formation behind, or above or below the tonsil), and, after five to ten days from the beginning of the attack, the pus finds its way to the surface of the tonsil, and breaks into the mouth, to the inexpressible relief of the patient. This event is followed by quick subsidence of the symptoms.

Quinsy is rarely a dangerous disease, yet occasionally it leads to so much obstruction in the throat that death from suffocation ensues unless a surgeon opens the throat and inserts a tube. Very rarely the pus from the ruptured abscess enters the larynx and causes suffocation.

Quinsy differs from tonsillitis in the following respects: the swelling affects the immediate surrounding area of the throat; there are no white spots to be seen on the tonsil unless the trouble begins

as an ordinary tonsillitis; there is great pain on swallowing; and finally, abscess forms near the tonsil in most cases.

**Treatment.**—A thorough painting of the tonsils at the onset of a threatened attack of quinsy with a twelve per cent. silver nitrate solution, as recommended under tonsillitis, may cut short the disorder. A single dose of calomel (three to five grains) is also useful for the same purpose.

The constant use of a hot flaxseed poultice (as large as the whole hand and an inch thick, spread between thin layers of cotton, applied as hot as can be borne, and changed every half hour) gives the greatest relief, and may possibly lead to disappearance of the trouble, if employed early enough. The use of the poultices is to be kept up until recovery, although they need not be applied so frequently as at first.

A surgeon's services are especially desirable in this disorder, as early puncture of the peritonsillar tissue may save days of suffering in affording exit for pus as soon as it forms.

The tonsils should be removed after an attack of quinsy to prevent recurrence of the trouble and to avoid the dangers of chronic tonsillitis (*See Symptoms of Mouth Breathing*).

#### DIPHTHERIA

Diphtheria is an acute infectious disease, characterized by a grayish membrane in the throat, produced by a special germ (*Klebs-Löffler bacillus*), and by fever and general symptoms caused by the poison formed in the growth of the germs.

No layman should ever attempt to treat diphtheria. The consideration of the disease in this book is mainly of importance in emphasizing the necessity of calling in expert medical advice at the earliest moment in suspicious cases of throat trouble, for, as we noted under tonsillitis, it is impossible in some cases for the expert to decide from the appearance of the throat whether the disease is tonsillitis or diphtheria.

A specimen of the secretion from the throat removed by the doctor for microscopical examination by a bacteriologist, to determine the presence of diphtheria germs, will alone decide the point.

When such an examination is impossible, it is always best to isolate the patient, especially if a child, and treat the case as if it were diphtheria.

**Causes.**—How is diphtheria acquired? Chiefly from contact with patients who have recovered sufficiently to go about but still carry the germs in their throats. This is prevented by Boards of Health requiring that patients shall be free from germs before they are released from quarantine. But diphtheria bacilli are found in the throats of one per cent. of healthy persons, and almost two per cent. of some 1,000 children in New York tenements were found to harbor virulent diphtheria germs in their throats.

Some persons are not susceptible to the diphtheria germs in their throats, and yet these same germs may be transmitted to others who will develop the disease. The germs will live for months on various articles, especially damp cloth. Various objects interchanged in school, as pencils, candy, gum and towels, may convey the germ. Many recent epidemics have originated in milk which has become contaminated in its route from the cow to the consumer by the hands or mouth of some person.

The subjects of mild and unrecognized cases, the healthy "carriers" of the germs, and convalescents from diphtheria, who may have the germs in their throats for many months after recovery from the disease, are the chief sources of the contagium. Emanations from sewage, formerly thought a cause of the disease, are now known not to be so.

**Period of Development.**—After exposure to diphtheria, from two to seven days elapse before the disease begins—more often two days (Osler).

**Symptoms.**—Diphtheria commences with fever ( $102^{\circ}$  to  $103^{\circ}$  F.), chilliness or severe chills, pain in the back and limbs, and often sore throat, and pain in swallowing. It may not be until the third day that the dirty gray or yellowish membrane forms on the tonsils and creeps up on the surrounding parts, as the palate (the soft curtain forming the roof of the back of the mouth), and the uvula (the little body hanging from the palate in the back of the mouth), and the bands (pillars) in front of the tonsils. But it may be, that



a case with only a single white spot on the tonsil is diphtheria; that a case with a red, sore throat, without any white spot at all, is diphtheria; and that a case with the tonsils dotted over with white spots, as seen in tonsillitis, is diphtheria. Of course, these instances are not common, but every doctor has seen them.

So that it is safer that a doctor take a specimen of the secretion from any sore throat, for laboratory examination, before committing himself to diagnosis. Persons are often more sick in the beginning with tonsillitis, than they are with diphtheria, for the fever is usually lower in diphtheria, and the headache, backache, and pains in the limbs less severe. Diphtheria is most common in children under five years (80 per cent. of cases) because they creep about the floor and place all sorts of articles in their mouths. In addition to the symptoms noted there is swelling of the glands of the neck, appearing as lumps under the back of the jaw, and pallor and weakness are marked.

Diphtheria may occur in many parts of the body other than in the throat. The next most frequent form is that in the nose. Nasal diphtheria may begin in the throat and extend to the nose, in severe cases, or the nose may alone be attacked, the throat showing no membrane. There is a watery or bloody discharge from the nostrils making the skin raw, and lumps or enlarged glands appear under the jaw, while fever and general symptoms may be more severe than in the throat form.

There is a mild form in which children feel well enough to play and go to school, and in which fever is absent, but in which discharge from the nose and membrane are present.

Certain conditions in the throat and mouth favor the growth of diphtheria germs, as bad teeth, enlarged tonsils, catarrh of the nose and throat, and sore mouth.

There are many complications of diphtheria. Heart failure is more common than in any other acute disease. Patients should always be kept in bed for some time after the membrane has disappeared for this reason. Heart trouble may not begin until the third to the sixth week of the disease after apparent recovery. There are vomiting, pain in the chest and region of the heart, difficult



breathing, and blueness of the lips and nails. Inflammation of the kidney (frequent examination of the urine is necessary) and paralysis are common complications. The paralysis is most often of the palate and there is difficulty in swallowing, so that liquids are returned from the nose, and the voice is nasal. This may appear in the second or third week and lasts about the same length of time. The legs are sometimes paralyzed, but recovery after months is the rule. Abscess in the ears and of the glands of the neck are occasional complications.

Membrane in the throat and nose does not always mean diphtheria, but usually this is the case. Occasionally (in about 25 per cent. of cases) other germs in scarlet fever, measles, whooping-cough, etc., give rise to a similar condition which can only be distinguished from true diphtheria by isolation of the germs from the throat in the laboratory. Moderate cases of diphtheria are of one to two weeks' duration.

One point which cannot be too strongly emphasized is that the throat of every sick child should be examined, as sore throat is often not complained of.

It is not uncommon for patients with mild forms of diphtheria to walk about and attend to their duties, and, in the case of children, to go to school and spread the disease in that inviting field. They may present only a red throat, or perhaps a white spot on one tonsil. In the case of sore throat in persons who have been exposed to diphtheria, especially if children, a specimen of mucus from the throat should always be sent to a pathological laboratory for microscopical examination.

Those persons with apparently normal throats who carry about diphtheria germs can only be discovered by laboratory examination of the secretion of their throats.

**Outlook.**—The use of antitoxin has wholly altered the death rate in diphtheria. The general death rate in some 183,000 cases of diphtheria in 150 cities, without antitoxin, was 38.4 per cent., and in 132,000 cases, with antitoxin, was 9.8 per cent. (Osler). The disease is naturally more fatal without antitoxin in infancy and lessens in fatality with age. Thus 87 per cent. of children die

during the first year; there is 20 to 25 per cent. mortality at the tenth year; and only one or two per cent. after the fortieth year. Notwithstanding this, old persons die of diphtheria, as George Washington, whose death in his sixty-eighth year was due to this disease. In cases in which antitoxin is given on the first appearance of the membrane the mortality is almost nil.

It is unwise for a physician in doubt as to the diagnosis to wait for a laboratory examination in a suspicious case. It takes at least twelve hours to get a report, and two or three examinations are sometimes necessary to secure a reliable diagnosis. It is not uncommon for the first report to be "negative" while the second report is "positive." Many lives have been lost through waiting for the result of laboratory examinations, since the favorable effects of antitoxin depend upon its early use. When the throat looks suspicious let the doctor give antitoxin at the same time that he takes the specimen for the laboratory. If the case turns out not to be diphtheria no harm is done, but if the disease is present, a life may have been saved.

**Prevention.**—The injection of small doses of antitoxin into persons who have been exposed to diphtheria will certainly prevent the disease. The immunity lasts about three weeks. Antitoxin was at first thought to be free from danger, but it has been found that death rarely results from its use in prevention or treatment of disease. The number of deaths compared to the frequency of its use is exceedingly small—one death in 18,000 injections according to some statistics. There is almost no danger in giving it to infants, as antitoxin has been injected into every child as a routine procedure each month in the Boston Children's Hospital, for a long period, without a death. Persons who have already had antitoxin, those who are subject to asthma, and those who are affected by the smell or proximity of horses, are more likely to suffer. If antitoxin is repeated every day or two there is no danger, but if a week or more has elapsed, or even years, after the last dose there may be danger from its repetition.

In such cases only two drops of antitoxin should be injected, which is perfectly safe for anyone, and if no unpleasant symptoms

have occurred after three hours, an ordinary dose may be given. It would be safer to use this method in any case where antitoxin is used for prevention or for treatment in persons possibly susceptible (see above). In the event of patients who present dangerous symptoms after injection of antitoxin—as distress, difficult breathing, blueness of the lips and finger nails, with failure of the pulse and breathing—the injection of one-fourth grain of morphin and one-hundredth grain of atropin is the proper treatment.

It is not infrequent for a rash like hives to appear in a week or ten days after the injection of antitoxin, and rarely there are some fever and pains in the limbs with swelling of the glands. The symptoms are usually mild, however, and last but a few days.

A new skin test (Schick) may be used to determine the susceptibility of a person to diphtheria—especially immediately after exposure. Most infants are born with immunity to the disease, inherited from their mother's blood. This passes off in a few years, and they become susceptible, but a large percentage of adults are immune, owing to a previous attack of the disease, or from the presence of diphtheria germs in their throats without the occurrence of diphtheria. When danger is not imminent a vaccine may be used to prevent diphtheria.

**Treatment.**—The treatment of diphtheria consists, first, in the use of antitoxin, and in rest in bed, with a rich, liquid diet. The antitoxin is injected under the skin, and large doses are much safer than small ones. The average first dose should be five thousand units. This may be repeated every six hours until improvement sets in in severe cases. Of course, such treatment can only be properly carried out by a physician, and the earlier the better.

Syringing the nose with boric acid solution (as much as will dissolve in warm water) from a fountain syringe, held but two feet above the patient, is desirable in children with nasal diphtheria. The tube should be introduced horizontally into one nostril, so that the solution will flow out the other. The throat should also be swabbed twice daily with hydrogen peroxid (1 part) and water (3 parts).

Young children make such a fuss over local treatment that it is often as well to rely wholly upon antitoxin. In persons who



have previously had antitoxin, in those susceptible to asthma or the presence of horses, the trial dose of two drops should be used before giving the usual amount.

#### MEMBRANOUS CROUP

Membranous croup is usually (in 80 per cent. of cases) diphtheria of the inside of the lower part of the throat (larynx), in the region of the Adam's apple. The chief object should be to distinguish membranous croup from ordinary catarrhal croup, in which there is spasm and swelling of the inside of the throat, but no membrane to obstruct it.

Usually the child with ordinary croup goes to bed well, or perhaps with a slight cold, and awakens in the night with the hard, barking cough, and crowing or whistling breathing of croup. This is soon relieved by application of cold cloths to the outside of the throat, by inhaling steam in the air of the room, and by taking half a teaspoonful of syrup of ipecac. Similar attacks may return on the next night or two, the child remaining comfortable during the day, except for an occasional hoarse cough.

Membranous croup begins in the same way as ordinary croup, for the first day or two, but then begins to grow suddenly worse with difficult breathing, hoarse or whispering voice, great restlessness, blueness of the lips and nails, and finally stupor. Fever is moderate, as in ordinary croup, but there is usually swelling of the glands behind the jaw. Persistent croup of increasing severity usually means membranous croup or diphtheria in the lower part of the throat. In at least fifty per cent. of cases membranous or white spots may be seen on the tonsils or upper part of the throat, and in many cases when this is not apparent, it is coughed up.

In membranous croup, when breathing is much obstructed, it will be necessary for a doctor to introduce a tube into the throat to be worn for some time. The tube inserted through the mouth (intubation tube) is generally preferable in children, although that one which is introduced through a wound in the outside of the throat (tracheotomy tube) may be preferable in children and usually is in adults.



## HOARSENESS

*(Acute Laryngitis)*

This is an acute inflammation of the mucous membrane of the larynx. The larynx is that part of the throat, in the region of the Adam's apple, which incloses the vocal cords and other structures used in speaking.

Hoarseness is commonly due to extension of catarrh from the nose in cold in the head and grippe. It also follows overuse of the voice in public speakers and singers, and is seen after exposure to dust, tobacco or other smoke, and very commonly in those addicted to alcohol.

**Symptoms.**—Hoarseness is the first symptom noticed, and perhaps slight chilliness, together with a prickling or tickling sensation in the throat. There is a hacking cough and expectoration of a small amount of thick secretion. There may be slight difficulty in breathing and some pain in swallowing.

The patient feels generally pretty well and is troubled chiefly by impairment of the voice, which is either husky, reduced to a mere whisper, or entirely lost. This condition lasts for some days or, rarely, even weeks. There may be a mild degree of fever at the outset ( $100^{\circ}$  to  $101^{\circ}$  F.). Very uncommonly the breathing becomes hurried and embarrassed, and swallowing painful, owing to excessive swelling and inflammation of the throat, so much so that a surgeon's services become imperative to intube the throat or to open the windpipe, in order to avoid suffocation. This serious form of laryngitis may follow colds, but more often is brought about by swallowing very hot or irritating liquids, or through exposure to fire or steam.

In children, after slight hoarseness for a day or two, if the breathing becomes difficult and is accompanied by a crowing or whistling sound, with blueness of the lips and signs of impending suffocation, the condition is very suggestive of membranous croup (a form of diphtheria), which certainly is the case if any white, membranous deposit can be either seen in the throat or is coughed up. Whenever there is difficulty of breathing and continuous hoarse-

ness, in children or adults, the services of a competent physician are urgently demanded.

**Treatment.**—The patient should take a bottle of effervescing magnesium citrate or other saline at the onset of the attack. The use of cold is advantageous. Cracked ice may be held in the mouth, ice cream can be employed as part of the diet, and an icebag may be applied to the outside of the throat. The application of a linen or flannel cloth to the throat wrung out of cold water and covered with oil silk or waterproof material, is also beneficial, and often more convenient than an icebag. Heat is as useful in laryngitis as cold, for persons who find it more agreeable. Flannel may be wrung out in hot water and applied to the throat and covered with oil silk and dry bandage. Frequent renewal of the application is necessary.

The patient must absolutely stop talking and smoking. If the attack is at all severe, he should remain in bed. If not so, he must stay indoors. At the beginning of the disorder a teaspoonful of paregoric<sup>1</sup> and twenty grains of sodium bromid are to be taken in water every three hours, by an adult, until three doses are swallowed.

Inhalation of steam from a pitcher containing boiling water is to be recommended. A tablespoonful of compound tincture of benzoin poured on the surface of the boiling water increases the efficacy of the steam inhalation. The head should be held above the pitcher, and a towel should cover both the head and pitcher to retain the vapor.

The employment, every two hours, of a spray from an atomizer, consisting of adrenalin chlorid solution (1 part in 10,000 of water) is most useful. This should be inhaled for some time into the lungs. Then this is immediately followed by another spray containing menthol and camphor (of each, ten grains) dissolved in albolene (two ounces), which should be continued throughout the disease. If the hoarseness persists and tends to become chronic, it is most advisable for the patient to consult a specialist in throat diseases for local examination and special treatment.

<sup>1</sup>Paregoric (opium) may be obtained only on a doctor's prescription.

## CROUP

Croup is an acute laryngitis of childhood, usually occurring between the ages of two and six years. The nervous (spasmodic) element is more marked than in adults, so that the symptoms appear more alarming.

**Symptoms.**—The trouble frequently arises as part of a cold, or as a forerunner of a cold, and often is heralded by some hoarseness during the day, increasing toward night. The child may then be slightly feverish (temperature not over 102° F., usually). He goes to bed and to sleep, but awakens, generally between nine and twelve p. m., with a hard, harsh, brassy, barking cough (croupy cough), and difficulty in breathing. The breathing is noisy, and when the air is drawn into the chest there is often a crowing or whistling sound produced from obstruction in the throat, due to spasm of the muscles and to dried mucus coating the lining membrane, or to swelling in the larynx. It is impossible to separate these causes. The child, as well as his parents, becomes frightened, and he cries and struggles, in this way aggravating the trouble. The worst of the attack is, commonly, soon over, so that as a rule the doctor arrives after it is past. While it lasts, however, the household is more apt to be alarmed than, perhaps, by any other common ailment.

Death from an attack of croup, pure and simple, has probably never occurred. The condition described may continue in a less urgent form for two or three hours, and may reappear on following nights or days in a less severe form. The child falls asleep and awakens next morning with evidences of a cold, hoarseness, and cough, which may last several days or a week or two.

The only other disease with which croup is likely to be confused is membranous croup (diphtheria of the larynx), and in the latter disorder the trouble comes on slowly, with hoarseness for two or three days and gradually increasing fever (103° to 105° F.), great restlessness, and difficulty in breathing, not shortly relieved by treatment, as in simple croup. In fifty per cent. of the cases of membranous croup it is possible to see—with a good light—a white,



membranous deposit on the upper part of the throat by holding the tongue down with a spoon handle and inspecting the parts.

Croup is more likely to occur in children suffering from adenoids, enlarged tonsils, indigestion, and decayed teeth, and is favored by dry, furnace heat, by exposure to cold, and by screaming and shouting out of doors.

**Treatment.**—Place the child in a warm bath (105° F.) and hold a sponge soaked in hot water over the Adam's apple of the throat, changing it as frequently as it cools. Hot camphorated oil rubbed over the neck and chest aids recovery. If the bowels are not loose, a teaspoonful of castor oil should be given or one or two grains of calomel. The most successful remedies are ipecac and paregoric. It is wise to keep both on hand with children in the house. A single dose of paregoric <sup>1</sup> (fifteen drops for child of two years; one teaspoonful for child of seven years) and repeated doses of syrup of ipecac (one-quarter to one-half teaspoonful) should be given every hour, until the child vomits and the cough loosens, and every two hours afterwards.

Generation of steam near the child also is exceedingly helpful in relieving the symptoms. A kettle of water may be heated over a lamp. A rubber or tin tube may be attached to the spout of the kettle and carried under a sort of sheet tent, covering the child in bed. The tent must be arranged so as to allow the entrance of plenty of fresh air.

Very rarely the character of the inflammation in croup changes, and the difficulty in breathing, caused by swelling within the throat, increases so that it is necessary to employ a surgeon to pass a tube down the throat into the larynx, or to open the child's windpipe and introduce a tube through the neck to prevent suffocation.

The patient recovering from croup should generally be kept in a warm, well-ventilated room for a number of days after the attack, and receive syrup of ipecac (ten drops) three or four times daily, until the cough is loosened. If ipecac causes nausea or vomiting, the dose may be reduced.

The disease may be prevented by a simple diet, especially at

<sup>1</sup> Paregoric (opium) cannot be obtained without a doctor's prescription.



night; by the removal of enlarged tonsils and adenoids; by daily sponging, before breakfast, with water as cold as it comes from the faucet, while the child stands, ankle deep, in hot water; and by an out-of-door existence, with moderate school hours; also by evaporating water in the room during the winter when furnace heat is used. When children show signs of an approaching attack of croup, three doses of sodium bromid (five grains for a child two years old; ten grains for one eight years old) should be given during the day at two-hour intervals. A warm bath before bedtime, and rubbing the chest and neck with hot camphorated oil, are also advisable.

## CHAPTER XI

### DISEASES OF THE AIR PASSAGES

Cough. Bronchitis. Pneumonia. Consumption. Asthma. Hay-fever.  
Influenza or la grippe.

#### **COUGH OCCURRING IN BRONCHITIS, PNEUMONIA, CONSUMPTION, OR TUBERCULOSIS, ASTHMA, AND INFLUENZA OR GRIPPE**

Cough is a symptom of many disorders. It may be caused by irritation of any part of the breathing apparatus, as the nose, throat, windpipe, bronchial tubes, and (in pleurisy and pneumonia) the covering membrane of the lung. The irritation which produces cough is commonly due either to congestion of the mucous membrane lining the air passages (in early stages of inflammation of these tissues), or to secretion of mucus or pus blocking them, and this occurs in the later stages.

Cough is caused by a sudden, violent expulsion of air from the chest following the drawing in of a deep breath. A loose cough is to be encouraged, as by its means mucus and other discharge are expelled from the air passages.

A dry cough is seen in the early stages of various respiratory diseases, as bronchitis, pneumonia, pleurisy, consumption, whooping-cough, and with irritation from enlarged tonsils and adenoids, occurring in children.

Irritation, produced by inhaling dust, or any irritation existing in the nose, ear, or throat, may lead to this variety of cough. The dry cough accomplishes no good, and if continuous and excessive may do harm. It demands medicinal relief.

**BRONCHITIS**

Cough following or accompanying cold in the head and sore throat generally indicates bronchitis.

The larynx, or lower part of the throat, ends just below the "Adam's apple" in the windpipe. The windpipe is about four and one-half inches long and three-quarters to an inch in diameter, and terminates by dividing into the two bronchial tubes in the upper part of the chest. Each bronchial tube divides and subdivides in turn like the branches of a tree, the branches growing more numerous and smaller and smaller until they finally end in the microscopic air sacs or air cells of the lungs. The bronchial tubes convey air to the air cells, and in the latter the oxygen is absorbed into the blood, and carbonic acid is given off.

Bronchitis is an inflammation of the mucous membrane lining these tubes. In the cough of an ordinary cold only the mucous membrane of the windpipe and, perhaps, of the larger tubes, is inflamed. This is a very mild disorder compared to inflammation of the smaller and more numerous tubes.

**Symptoms.**—In bronchitis, besides the ordinary symptoms of a severe cold in the head, as sneezing, running of mucus from the nose, sore throat, some hoarseness (perhaps), and languor and soreness in the muscles, there is at first a feeling of tightness, pressure, and rawness in the region of the breastbone, with a harsh, dry cough. The coughing causes a strain of the diaphragm (the muscle which forms the floor of the chest), so that there are often pain and soreness along the lower borders of the chest where the diaphragm is attached to the inside of the ribs. After a few days the cough becomes looser, greatly to the patient's comfort, and a mixture of mucus and pus is expectorated.

In a healthy adult such a cough is usually not in itself a serious affair, and apart from the discomfort of the first day or two, there is not sufficient disturbance of the general health to interfere with the ordinary pursuits. The temperature is the best guide in such cases; if it is above normal (over 99.5° F.) the patient should stay indoors. In infants, young children, enfeebled or elderly people,

bronchitis may be a serious matter, and may be followed by pneumonia through extension of the inflammation from the small bronchial tubes into the air sacs of the lungs, and infection with the pneumonia germ.

The principal signs of severe attacks of bronchitis are cough, rapid breathing and pulse, and fever.

The normal rate of breathing in adults is seventeen a minute, that is, seventeen inbreaths and seventeen outbreaths. In children of one to five years the normal rate is about twenty-six breathing movements a minute. In serious cases of bronchitis the rate may be twenty-five to forty in adults, or forty to sixty in children, per minute.

Of course, the only exact way of learning the nature of a chest trouble is through careful examination by a physician, for cough, fever, rapid breathing, and rapid pulse occur in many other diseases besides bronchitis—particularly pneumonia.

**Treatment of Acute Cough and Bronchitis.**—In the case of healthy adults with a cough accompanying an ordinary cold, the treatment is very simple, when there is little fever or disturbance of the general health. The remedies recommended for cold in the head (in the preceding chapter) should be taken at first. It is also particularly desirable for the patient to stay in the house, or better, in bed for the first day or two or until the temperature is normal.

The feeling of tightness and distress in the chest may be relieved by applying a mild mustard paper over the breastbone, or a poultice containing mustard (one part) and flour (three parts) and warm water mixed into a paste and spread between two single thicknesses of cotton cloth about eight inches square. Tincture of iodine painted twice over a similar area forms another convenient application instead of the mustard.

Children suffering from recent cough with fever should be kept in bed while their temperature is above normal. It is well to give infants at the start a grain of calomel or a teaspoonful of castor oil, and double the dose for children of five to eight years.

The chest should be rubbed with a liniment composed of one part of turpentine and two parts of camphorated oil in mild cases.



while in more severe attacks the use of mustard (see below) is much more efficient. No more clothing than usual should be worn over the chest. The jacket of thick cotton wadding, formerly used, is now considered inadvisable. It is essential to keep the room at a temperature of about 68° F. and well ventilated, not permitting babies to crawl on the floor when able to be up, or to pass from a warm to a cold room.

In the beginning of the attack syrup of ipecac every two hours is the best drug—two to three drops for a child under one year and up to three years, and later, five drops; children over ten and adults ten drops, unless it causes nausea or vomiting, when the dose may be reduced one-half.

If children become “stuffed up” with secretion so that the breathing is difficult and noisy, a teaspoonful of the syrup of ipecac should be given to make them vomit, for until they are six or seven years old children cannot expectorate, and mucus which is coughed up into the mouth is swallowed by them. Vomiting not only gets rid of that secretion which has been swallowed, but expels it from the bronchial tubes. This treatment may be repeated if the condition recurs.

In young children, medicine is to be avoided as far as possible. If coughing is so constant at night as to interfere with the sleep, paregoric<sup>1</sup> may be given in one-quarter of a glass of water as follows:

Five drops at six months  
Ten drops at one year  
Twenty drops at three years  
Thirty drops at five years  
A teaspoonful at twelve years or over

These drops should preferably be measured in a measuring glass. They may be repeated in two hours if necessary.

A paste consisting of mustard (one part) and flour (eight parts) is very useful when spread in a layer one-fourth of an inch thick between two pieces of thin muslin, large enough to make two plasters, one covering the back and the other the whole front of the chest.

<sup>1</sup> Paregoric (opium) can now only be obtained by a doctor's prescription.

The skin under the plaster should be inspected from time to time, and when it is quite red the plaster should be removed and vaselin applied. The application of the mustard plaster should be repeated once in six hours, unless the skin is too red.

In young children with severe attacks of bronchitis, as shown by rapid breathing, cold feet and hands, and much depression of spirits, the mustard bath is invaluable and may prevent an attack of pneumonia. One-half an ounce of Coleman's mustard (heaping tablespoonful) is mixed in twenty-four quarts of water at 110° F. (about as hot as can be comfortably borne) and the child is submerged in it for five or ten minutes. It may be repeated every six hours.

The diet should be only milk for young children during the first day or two, and older patients should not have much more than this, except toast and soups. In feeble babies with bronchitis, it is wise to give five or ten drops of brandy or whisky in water every two hours, to relieve difficulty in breathing.

Children who are subject to frequent colds, or those in whom cough is persistent, should receive cod-liver oil—one-half to one teaspoonful, according to age—three times daily after eating. One of the emulsions may be used instead, if the pure oil is unpalatable.

Adenoids and enlarged tonsils are fruitful sources of constant colds and sore throat, and their removal is advisable. Children should be hardened by a cold sponge and brisk dry rub after the daily morning warm bath. Sleeping in rooms with the windows wide open, or better, out-of-doors, has also a good effect in preventing colds. Keeping young children bare-legged is an abomination and favors colds. Also children should wear long underdrawers in colder climates to cover the space between the tops of their stockings and drawers. When children have constant colds it will be found that an outdoor life in the country is usually the best cure.

### PNEUMONIA

**Symptoms.**—Pneumonia begins suddenly, often with a severe chill, headache, and general pains like grippe. In a few hours cough commences, short and dry, with violent, stabbing pain in one

side of the chest, generally near the nipple. The breathing becomes rapid, with expanding nostrils, the face is anxious and often flushed on one cheek. The matter coughed up at first is often streaked with blood, and is thick and jellylike. The temperature is frequently  $104^{\circ}$  to  $105^{\circ}$  F.

If the disease proceeds favorably, at the end of five, seven, or ten days, the temperature, breathing, and pulse suddenly become normal, and the patient rapidly emerges from a state of danger and distress to one of comfort and safety. The sudden onset of pneumonia with chill, agonizing pain in side, rapid breathing, and often delirium with later bloody or rusty-colored, gelatinous expectoration, will then usually, though not always, serve to distinguish it from bronchitis.

Whenever, with cough, rapid and difficult breathing occurs with rise of temperature (as shown by the thermometer) and rapid pulse, the case is serious, and medical advice is urgently demanded.

**Treatment.**—Patients developing the symptoms described as suggestive of pneumonia need the immediate attention of a physician. If a person is unfortunate enough to have the care of such a case, when it is impossible to secure a physician, it may afford some comfort to know that good nursing is really the prime requisite in aiding recovery, while skillful treatment is of most value if complications arise.

The greatest recent advance in the treatment of pneumonia has been that of keeping the patient out-of-doors in a sheltered porch or piazza, or turning the room into outdoors in so far as possible by removing the window sash or using a window tent. There should be at least two windows on opposite sides of the room and the patient should be screened from direct drafts. Winter weather is as suitable as summer unless the temperature is below zero.

The patient should be warmly, but not heavily, covered and a folded blanket and rubber sheet should be laid under the mattress to prevent the cold passing through it. The patient should have a hot water bag at his feet in cold weather. The bed should be moved indoors or into a warm room when the patient has to be bathed. A flannel jacket may be made, to surround the chest, and should

open down the whole front. The nightshirt is to be worn over this—nothing more.

Daily sponging of the patient with tepid water ( $85^{\circ}$  to  $90^{\circ}$  F.) should be practiced. The body is not to be all exposed at once, but each limb and the trunk are to be separately sponged and dried. If the fever is high (over  $104^{\circ}$  F.) the water should be cool ( $80^{\circ}$  F.), and the sponging done every three hours in the case of a strong patient. The sponging is done for five minutes at a time, while the skin is being briskly rubbed to keep up the circulation.

Visitors must be absolutely forbidden: no more than one or two persons are to be allowed in the sickroom at one time.

The diet should consist chiefly of milk—a glass every two hours, varied with milk mixed with thin cooked cereal, or eggnog, or coffee, or tea (two cups daily), and broths, with orange juice once daily. It is wise to give a cathartic, such as five grains of calomel, followed in twelve hours by a Seidlitz powder, at the beginning of the disease, if the bowels do not act freely before that time.

To relieve the pain in the side, if excruciating, one-quarter grain morphin sulphate<sup>1</sup> should be given, and repeated once in two hours, if necessary. The application of an icebag to the painful side frequently stops the pain (in children a hot flaxseed poultice is better) and, moreover, is excellent treatment throughout the course of the disease. The seat of pain usually indicates that the lung on that side is the inflamed one, so that the icebag should be allowed to rest against that portion of the chest. Water should be very freely supplied and should be given as well as milk, even if the patient is delirious.

The bowels are to be moved daily by glycerin suppositories or injection of warm water.

**Death Rate.**—The death rate in pneumonia differs greatly with circumstances. In hospital practice it varies from thirty to forty per cent., in private practice from six to seventeen per cent. Half the patients over sixty years of age die of pneumonia; eighty-seven per cent. die between seventy and eighty years. About one-third of

<sup>1</sup>Morphin is a powerful drug and can only be obtained by a doctor's prescription.



infants under one year old die with pneumonia, while in the second year only one-sixth die. In some years the mortality from pneumonia is vastly greater than others, varying from five to thirty per cent.

In specially selected young men, as soldiers, the death rate from pneumonia is only one in twenty-five cases. On the other hand, pneumonia is the common cause of death in old age. Persons enfeebled with disease or suffering from excesses, particularly alcoholism, are also likely to die if stricken with the disease.

Pneumonia is the cause of one in every ten deaths in the United States.

### CONSUMPTION

#### *(Tuberculosis of the Lungs—Phthisis)*

This disease is of extreme importance because, above all others, it is the great destroyer of human life, until recently causing one-seventh<sup>1</sup> of all deaths. But, on the other hand, so far from being such a fatal disease it may become an eminently curable one—if recognized in its earliest stage. The fact that practically everybody is attacked with tuberculosis at some time during life, is well recognized by the medical profession.

In children living in tenements it is said that by fourteen years of age 90 per cent. have acquired tuberculosis. The reason why the disease fails to progress in most persons is that the system is strong enough to resist it. Tuberculous disease is arrested by the germs becoming surrounded by a barrier of healthy tissue, and so perishing in their walled-in position. The facts prove that so far from being incurable, recovery from consumption is the rule without the patient even knowing that he was sick. This is shown by the discovery of old healed tuberculous areas (60 to 70 per cent. in the lungs) in most persons after death from other diseases.

It is only those cases which become so far advanced as to be readily recognized by anybody that are likely to result fatally. Many more cases of consumption are cured now than formerly, because exact methods have been discovered which enable us to diagnose the disease at any early stage of its development. The death rate

<sup>1</sup> This is now reduced to one-ninth in the United States.

from tuberculosis in England is 50 per cent. lower than it was forty years ago, and in the United States the improvement is as marked.

**Causes.**—Consumption is due to the growth of a special germ (*Bacillus tuberculosis*) in the lungs. The disease is communicable from a consumptive to a healthy person by means of the germs present in the sputum (expectoration) of the patient. The germs also escape from the body in the bowel movements, urine, and sometimes in the sweat. From cows, the disease is chiefly communicated by germs in manure falling into the milk.

The danger of an adult acquiring the disease directly from a consumptive patient is slight—if one take the precautions mentioned later in this chapter, except in the case of a person living or working in constant close contact with a patient. This is proved by the fact that attendants in hospitals for consumptives are rarely affected by the disease. Persons in the early stages of consumption sometimes have none of the germs in their sputum and in these cases the danger of communicating the disease is negligible.

Consumption is said to be inherited. This is not the case, as infants are not born actually bearing the living germs of the disease in their bodies, even when born of consumptive mothers. A tendency to the disease is, however, seen in certain families and this tendency may be inherited in the sense that the offspring has lungs which possess less resistance to the growth of the germ of consumption. But a still greater danger threatens the infant of consumptive parents in that it is directly exposed to the germs of the disease after it is born. Infants creep about the floor and put everything into their mouths so that, in the case of consumptive parents who are negligent about their sputum and personal cleanliness, the child is almost certain to acquire the disease.

Then exposure to the disease in an adult working in an office or shop with a consumptive is so dangerous that this question has become a part of life insurance examinations. Certain occupations and diseases render the individual more susceptible to consumption. Thus stone cutters, knife grinders and polishers are more liable to the disease through inhalation of irritating dust. Plasterers, cigar makers, and upholsterers are next in order of susceptibility for

the same reason, while out-of-door workers are less likely to acquire the disease than any other class, with the exception of bankers and brokers.

Among diseases predisposing to consumption are the following: colds and bronchitis, influenza, pneumonia, measles, whooping-cough and nasal obstruction in causing mouth breathing. The state of being generally "run down," having low fever, or pleurisy, is often simply the first stage of consumption.

No age is exempt, from the cradle to the grave, although the liability to the disease diminishes markedly after the age of forty. About one-third more women than men recover from consumption because it is more practicable for them to alter their mode of life to suit the requirements of treatment.

The neglected cold or cough offers a favorable field for the growth of the germs of consumption. A cough or cold lasting a month should always lead one to consult a doctor. So also anyone who is losing weight, strength, and energy, even if there is no cough, should seek medical advice. As it is essential above all else that the disease be recognized early, it is necessary that every person should know the signs and symptoms which suggest the beginning of consumption.

**Symptoms.**—Cough is the most constant early symptom. It may, however, be wholly absent or there may be only a tendency to clear the throat frequently, or there may merely be tickling in the throat. The cough is more apt to be dry and hacking and more troublesome at night and in the early morning.

Expectoration is a later sign. The sputum should be repeatedly examined when there is any suspicion of consumption. All the sputum should be collected in a clean, wide-mouthed bottle for three days before it is sent for microscopical examination.

Very important early symptoms are loss of weight, strength, energy, and appetite. Patients often come to doctors complaining chiefly of loss of energy and interest in their business. Dyspepsia, with cough and loss of weight and strength, form a common group of symptoms. The patient is pale, has heartburn, nausea or vomiting, and weakness. There is often a slight rise of temperature in



the afternoon, and in women, absence of monthly periods. Every person exhibiting the symptoms mentioned should take his temperature at eight, twelve, four, and eight o'clock.

A constant temperature in the afternoon of  $99.2^{\circ}$  to  $99.4^{\circ}$  F. or over, or a constant subnormal temperature (below  $98^{\circ}$  F.), together with a pulse of over 100, and cough, loss of appetite, weight, and strength, form a group of symptoms almost certainly indicative of consumption, in the absence of other known cause.

The thermometer should be kept in the mouth for five minutes each time, and the temperature should be taken before meals, or at least an hour after meals. The highest temperature will be found at about four p. m. usually. The pulse, as has been noted, is increased in frequency.

Night sweats are not an early symptom in consumption and they occur more often in the early morning hours. However, chills, fever, and sweating are sometimes the first symptoms in consumption, and in a malarial region would probably lead to error, since these symptoms may appear at the same intervals as in ague. But the fever is not arrested by quinin, as in malaria, and cough, loss of weight, not commonly prominent in malaria, are also present. Persistently enlarged glands, which may be felt as lumps under the skin along the sides of the neck or in the armpits, are also suggestive of tuberculosis.

The spitting of bright red blood with coughing is one of the most certain signs of lung tuberculosis, and occurs in about 80 per cent. of cases of consumption; but this is often not an early symptom. Bleeding from the lungs usually follows coughing or severe exercise, but blood may appear in the mouth without any apparent cause whatever.

If the blood is not pure, but if the sputum is simply streaked with blood, the chances that the origin may be in the mouth or throat are greater. Diseased tonsils in children, and diseased gums and teeth in adults, may lead to bleeding.

In case a patient wakes in the morning and spits blood from the mouth it may often happen that the bleeding is from the nose and upper part of the throat, especially if the person is subject to



nosebleed. Hemorrhage from the mouth from consumption is more apt to appear in women at a menstrual period.

It is a rule that the spitting of blood from the mouth should be considered a sign of consumption unless some other origin is evident.

Pain is also a frequent but not constant early symptom, as pain beneath or between the shoulder blades, or in the region of the breastbone. The voice is often somewhat hoarse or husky at the beginning of consumption. Shortness of breath on exertion is not so common an early symptom as later. Prior exposure of the patient to tuberculosis would make the symptoms described still more suspicious.

To sum up, one should always suspect consumption in a person afflicted with chronic cough, and losing weight, strength, and energy, especially if there is a rapid pulse and a slight daily rise in temperature, or a constant subnormal temperature. Such a person should immediately apply to a physician for general examination, especially of the lungs and sputum (expectoration).

If the germs of tuberculosis are found on microscopical examination of the sputum, the existence of consumption is absolutely established. Failure to find the germs in this way does not, on the other hand, prove the patient to be free from the disease. In some cases examination of both lungs and sputum reveals no sign of the disease, while the symptoms make the diagnosis probable.

There is also a substance called tuberculin, or the poison formed by the germs of tuberculosis during their growth, which, when injected under the skin in suspected cases of consumption, causes a rise of temperature in persons suffering with the disease, but has no effect on the healthy. Persons, however, having practically healed tuberculosis may react to the test as positively as those with a serious type of the disease, unless minute doses—less than one-sixtieth of a grain—are used. Also when the test is positive we know that tuberculosis is present, but it may be in any part of the body. The results of tuberculin injection in the consumptive are similar to a very short attack of grippe. It is not commonly necessary to make this test but in those cases in which the diagnosis is doubtful its use is followed by no lasting ill effects when given by a competent doctor.

The use of the x-ray in the hands of experts certainly reveals the presence of consumption, but it is impossible for the examination to distinguish between old healed areas, which are not responsible for present symptoms, and recent disease in the lung which is causing the symptoms complained of.

**TUBERCULOSIS IN CHILDREN.**—Tuberculosis is the most common disease in children. While none is born with it, tuberculosis may be acquired soon after birth and is extremely fatal during the first two years. After that time the mortality from tuberculosis in children is comparatively slight.

Tuberculosis in children begins in glands at the base of the lungs and in glands elsewhere. Tuberculosis of the lungs is rare in childhood, and if present is evidence of advanced disease.

The symptoms are failure to gain in weight on sufficient food, loss of energy, weakness, irritability, loss of appetite and pallor, with fever. There may be a dry, throaty cough (which can however be caused by enlarged tonsils and adenoids).

Examination of the chest will rarely reveal the enlarged glands at the base of the lungs. X-ray examination is here invaluable in showing the enlarged glands in the chest. The simple application of a drop of tuberculin rubbed into the abraded skin will surely show the presence of active tuberculosis in children of five years or younger. By the time children have reached the age of fifteen, at least 50 per cent. are afflicted with tuberculosis, and, in tenements, 90 per cent. Many cases show no symptoms of the disease.

Children acquire the disease by exposure to tuberculosis in members of the family, or when this can be ruled out, milk is the most probable source. About one-quarter of the cases of tuberculosis in children arise from milk. It must either be supplied from absolutely tuberculosis-free cows (always a matter of doubt even in certified dairies) or should be pasteurized at home before being used (Part II, Chapter II).

**Treatment.**—One of the most important matters to decide in consumption is whether the patient shall be treated at his home or in a sanatorium. The sanatorium is much the better place, for a time at least, as the patient is drilled in the way of life and care of himself,

not usually possible at home. Those patients who are throwing off germs in their sputum should always be treated in a sanatorium as they menace all about them.

In regard to climate the ideal conditions for out-of-door existence are pure air and as much sunshine as possible. Dryness, an even temperature, and an elevation of two thousand to three thousand feet are often most desirable, but not necessary for success. Sanatoriums in many parts of the country, and in the vicinity of many of the large cities, attain excellent results in early tuberculosis without the benefit of special climate. Arizona, New Mexico, Colorado, the Adirondacks, and some parts of California, contain the most favorable climatic resorts in this country. But it is preferable for the patient to remain at home under proper treatment in a sanatorium than to lead a random life in popular climatic resorts. Sanatorium treatment is best anywhere for a time.

If the patient must stay at home, the following line of treatment should be pursued. He should remain out-of-doors all hours of bright days—ten to twelve hours in summer and six to eight hours in winter—without regard to temperature. He should sleep on a porch, veranda or roof out-of-doors. When this is not possible, Dr. Knopf's window tent may be used which covers the upper part of the body in bed, while enclosing an open window.

In warm weather a tent may be used with a suitable floor and boarded up on the sides a few feet from the ground. The outdoor shelter should be large enough (ten by ten feet) for a bed, table, and reclining chair, and be capable of being protected on all sides, while one or more sides should be kept open at night. A room, with even three or four windows, does not give such good results as an open outdoor porch protected by canvas curtains, sliding glass, or bamboo Venetian blinds. The porch should be on the south side or, if this is not possible, the east or west, but the north side of the house should not be chosen for winter use. The porch should have a sliding glass sash, on the side most exposed to the weather, with curtains on the other two sides, and be connected by a door with a warm living room from which a bed may be rolled easily onto the porch.



Two mattresses are desirable in cold weather with paper blanket between. A wool horse blanket with its outer side of canvas protects the bed in stormy, wet weather. In winter blanket sheets should be used and, on the body, a wool undershirt, sweater and outing flannel nightgown or bathrobe are worn in sleeping. In addition, in very cold weather woolen socks and drawers may be used. A hot water bag wrapped in flannel should be placed in the bed before retiring in cold weather.

It is better for the patient to get into bed in a warm room and be rolled outdoors when possible. Blankets or comforters should be tucked under the bed pad (a folded blanket), which is placed on top of the upper mattress, but the outermost cover should be tucked under the upper mattress to make the bed secure and warm. The head of the bed must be protected from wind by being placed against a wall, or the head of the patient may be protected by a canvas shield like a buggy top. One may wear a knitted helmet covering the whole head and neck, with the exception of a small hole for the nose and mouth, or a kind of sunbonnet made of many thicknesses of flannel. Cold cream on the face and lips will prevent chapping, and a piece of flannel may be held over the nose by a strip of adhesive plaster.

For sitting out in cold weather, in addition to the ordinary clothes and sweater, a fur coat is most useful and fur or heavy woolen mittens. Two or more loose, heavy, wool socks with felt shoes and foot muffs should protect the feet. A heavy blanket may be placed on a steamer chair and wrapped about the patient, and the whole covered with a steamer rug. No one should remain out when chilled; when this occurs the patient should go into a warm room and take a glass of hot milk.

If a patient is weak or feverish he should remain in bed or on a couch, or on a porch during the day, and in a room with many open windows at night, so that there will be a good draught through the room. The patient may be protected by screens. Such symptoms as cough, fever, night sweats, or spitting of blood should not be allowed to interfere with the fresh air treatment. Only the most severe cold and storms may be permitted to drive the patient in.



During the first month of treatment the patient should take very little exercise, and none at all if there is fever. If on taking the temperature an hour after walking it is found to be above normal, and the pulse is over eighty-five, all exercise should be avoided for a time.

Nutritious food is of equal value with the open air life. A liberal diet of milk, cream, eggs, meat, and vegetables is advised. A glass of milk with each of the three meals, and a glass containing a mixture of equal parts of cream and milk in the middle of the morning, afternoon, and at bedtime, are to be recommended. In place of the milk and cream, two eggs beaten with a little sherry may be taken by way of variety.

If the appetite is very poor it is best that a glass of milk be taken every two hours, varied by beaten eggs with sherry, or a few tablespoonfuls of juice squeezed from rare beef. Gain in weight is usually the most favorable sign but in some cases, when the patient is well nourished, this is not essential. To prevent constipation the patient may take liquid albolene or agar and bran.

Drug treatment depends upon individual symptoms and therefore can only be given under a physician's care. The same applies to the only special treatment known, that of tuberculin. Many patients are much benefited by tuberculin given by an expert. Given otherwise it may do much harm. Recently the injection of nitrogen gas into the space surrounding the lung has given good results in some cases, but this treatment cannot be readily done at the patient's home.

The outdoor treatment is possible even in cities but, for patients living out of town, it frequently gives excellent results when the subject is under a doctor's care. For those not able to go to a sanatorium or take advantage of a change of climate there is much more hope than formerly.

In tuberculosis in children when the glands are chiefly affected, and often those at the root of the lungs, outdoor sleeping, and keeping the child outdoors in the day also, will accomplish wonders. The child should take daily a pint of half milk and half cream, between meals, and a glass of rich milk, with beef juice, eggs, and meat, at

meals. A child may attend the outdoor schools, which are now quite common, after improvement has begun. The tuberculin treatment of children gives excellent results in the hands of an expert. It is rarely necessary to send a child with early tuberculosis to a sanatorium.

**Prevention.**—Weak children and those born of consumptives must receive a generous diet of milk, cream, eggs, meat and vegetables, and spend most of their time out-of-doors during the day and sleep out-of-doors at night. The milk should all be pasteurized at 145° F. for thirty minutes.

If one of the family is tuberculous, and discharging the bacilli in the sputum, the home is not a safe place for a child. The same applies to children with actual tuberculosis of the lung; they are a special menace to others and can be treated most satisfactorily in a sanatorium.

This condition is, however, rare in childhood. A consumptive adult should have a separate sleeping room and refrain from caressing or kissing others. All dishes and eating utensils used by a consumptive should be boiled after use. The sputum should be received in paper bags or boxes made for the purpose, which should be burned before the contents dries. Out-of-doors the sputum may be deposited in a wide-mouth bottle, the contents of which is placed in a fire, and the bottle should be boiled. The use of rags, paper napkins, and handkerchiefs is unwise.

The sputum is practically the sole medium of contagion in adults, and if it is properly cared for there is little danger to adults in contact with the patient. When a consumptive has no sputum or there are no bacilli discharged in the sputum, there is no danger of contagion. In young children with tuberculosis of the lung, the sputum is swallowed and the bowel discharges must be carefully disinfected.

No dusting should be done in a consumptive's room—only moist cleansing. Plenty of sunshine in a room will cause destruction of the germs of consumption beside proving beneficial to the patient. In persons having bacilli in their sputum the fine spray emitted in coughing and sneezing disseminates germs into the surrounding air.

## ASTHMA

Asthma is a state of difficult breathing due to disturbance of the nerves controlling the caliber of the smaller bronchial tubes in the lungs. Attacks often begin suddenly, owing to partial closure of the bronchial tubes from spasm, and also from swelling due to congestion—as may be seen in the nose in the closely allied disease—hay-fever.

**Causes.**—The chief cause of asthma is disease in the nose, cavities in the head connecting with the nose, and in the throat. When such existing conditions as obstructions in the nose, adenoids, enlarged tonsils, polypus, etc., are removed by the throat specialist, and the resulting catarrh cured, it will be found that the asthma will also be cured in most cases. Colds and coughs also favor asthma but these are frequently secondary to the causes noted. The disease may be of purely nervous origin in some cases.

In susceptible persons, that is, those having chronic disease in the nose and throat and the peculiar nervous organization favoring asthma, attacks may be brought on by emanations from animals (horses, dogs, and cats), by the pollen of flowers and hay, and by dust and heat.

It is common knowledge that the most extraordinary circumstances provoke attacks of asthma in the susceptible, such as slight changes of air, which may be found in rooms of the same house, and in the same city. That is, a patient may have asthma in one story of a house and not in another, or in one part of a city and not in another. Overeating and dyspepsia favor the disorder; also emotion, fright, changes in temperature, and change of residence.

Asthma occurs in males (in 66 per cent. of cases) between childhood and forty, especially in nervous, weakly, anemic persons subject to rickets or tuberculosis. It is known that asthmatics may be badly affected by diphtheria antitoxin.

**Symptoms.**—Attacks are sudden, and occur more often at night. Sometimes there are warning signs, as cold in the head, chilly feelings, tightness in the chest, mental depressions, etc. Breathing suddenly becomes difficult; there is a feeling of weight on the



chest; the patient fights for breath. He may go to an open window, and draw in air with great difficulty while the expiration is prolonged and wheezy. The face grows pale, anxious, and covered with sweat; the feet and hands cold, and the lips blue; speaking may be impossible and the voice is faint and hoarse. Just as the patient appears to be suffocating the attack may subside with coughing and spitting of minute sticky balls of mucus in a thinner secretion.

The attacks may last but a few minutes, or one to two hours, and return at long or short intervals. No death has ever been recorded during an attack of asthma, although the disease appears most alarming. After many seizures the breathing may be wheezy and short much of the time, and chronic bronchitis is usually present.

The outlook is uncertain; sometimes attacks occur from childhood to old age but may cease at any time, particularly if the cause can be discovered and removed.

**Treatment.**—During an attack nothing gives such rapid and sure relief as a hypodermic injection of one-quarter grain of morphin, which should be given by a physician. When a doctor is not available the patient may break one of the glass pearls containing three drops of amyl nitrite in the handkerchief and inhale the drug with immediate relief. Prompt arrest of an asthmatic paroxysm is often secured by inhalation of chloroform. For the patient to do this safely he must rinse the inside of a tumbler with chloroform, pour the chloroform back into the bottle and cork it, and then inhale the chloroform from the tumbler. This may be repeated a few times.

A drink, containing four tablespoonfuls of hot water and whisky and a teaspoonful of spirit of chloroform, is often efficacious, or whisky alone in those not accustomed to it. A cup of strong coffee, smoking a cigar or cigarette of tobacco (in non-smokers) or those made especially for asthma (as cigarettes d'Espic) may also be tried. The application of a paste of Coleman's mustard (one part mustard and three parts flour) between two layers of thin muslin to the chest will aid in arresting an attack of asthma.



Between the attacks a combination of potassium iodid and strontium bromid (each ten grains, three times daily in half a glass of water after eating) is the most efficient remedy. To avoid the continuance of asthma it is emphatically advisable to consult a physician who may be able to discover and remove the cause.

The diet should consist chiefly of eggs, fish, milk, and vegetables (with the exception of beans, large quantities of potatoes, and roots—as parsnips, beets, turnips, etc.). Meat should be eaten but sparingly; also nuts, pickles, hard boiled eggs, cheese, pork, pastries, sugar, and starches (as cereals, potato, and bread). The evening meal ought to be light, dinner being served at midday.

Any change of climate may stop asthmatic seizures for a time, but the relief is apt to be temporary. Climatic conditions affect different patients differently. Warm, moist air in places destitute of much vegetation (as Florida, the Bermudas, West Indies, Southern California, the shore of Cape Cod, and the Island of Nantucket, in summer) enjoy popularity with many asthmatics, while a dry, high altitude influences others much more favorably—as the Adirondacks.

#### HAY-FEVER

**Cause**—The sole cause of this disease, but recently discovered, appears to be pollen—owing to its mechanical (sharp projections on pollen) and chemical (poison, toxalbumin) irritation of the mucous membrane of the nose and eyes. There is enough of the poison in two pollen grains to affect sensitive persons. Early cases in May and June (rose cold) are due to the pollen of the grass family (including the grains).

The true hay-fever of late summer is due to pollen of weeds, and eighty-five per cent of cases to ragweed. Pollen is carried by insects and wind. The pollen of inconspicuous flowers, or weeds, is abundant and wind-blown and the source of hay-fever. The pollen of showy, honeyed flowers is smaller in amount and conveyed by insects to other flowers. Pollen may be blown in sufficient quantity a half mile to cause hay-fever in susceptible subjects.

The disease is twice as common in males as in females, and is inherited in a large percentage (33 per cent.) of cases. In early

summer it is sometimes called rose cold, and in August and September it is known as hay-fever. It terminates immediately after the first frost. In the Southern States it is present all the year.

Hay-fever prevails among those between fifteen and thirty years of age and in the educated and highly nervous. A peculiar susceptibility of the nasal mucous membrane to the irritation of pollen seems to exist, especially if there are abnormalities in the nose, as polypi, spurs, and enlargement of the turbinates in the nose.

**Symptoms.**—The disease begins like a common cold in the head, but there is more bodily depression and often fever of  $100^{\circ}$  to  $101^{\circ}$  F. Light hurts the eyes, which are inflamed, red, and weeping, and the nose is frequently red also. Headache is common, and sneezing and cough increase the distress. Asthma sometimes accompanies or follows an attack of hay-fever. A return of the trouble is probable, but the disease usually disappears as age advances.

**Treatment.**—General treatment includes the use of tonics to the nervous system, such as capsules, each containing one-thirtieth of one grain of arsenic trioxid and one-sixtieth of one grain of strychnin sulphate—one to be taken three times daily after meals. Cold baths or cold sponging daily are also of service. As light hurts the patient's eyes, exercise should be taken out of doors morning and evening and dark glasses will protect the eyes to some extent.

Local treatment must be given by an expert in nose and throat diseases and the use of a cautery or removal of growths may give much relief. The frequent spraying of the nose with Seiler's solution and, following this, with a spray of albolene containing fifteen grains of menthol and camphor to the ounce, will usually afford comfort. Sometimes the spraying of a solution of adrenalin (1 part in 5,000 of water) in the nostrils will arrest the disease by contracting the blood vessels. This may be done several times daily.

Special treatment with horse serum, which has been obtained from animals injected with the poison in pollen, is used in the form of powder sold as pollantin, and this may be applied to the nose in the morning, after sleeping with closed windows at night—to keep out pollen in the air. The effects of pollantin vary much, many

patients being greatly improved by it, while in some the condition is aggravated.

When the disease is not being cured by local treatment, and for all patients who can manage it, a change of residence is advisable. In the Eastern States, the Adirondacks and White Mountains are favorite resorts, also barren islands, like the Isles of Shoals. In the West, Banff, in the Canadian Rockies, is most highly recommended, while in Europe many places are to be found, among which Heligoland is perhaps the most popular for this disease. The object is to be rid of the presence of pollen from vegetation and to get into a bracing climate. There is no other disease which so quickly yields to change of climate as hay-fever.

The destruction of weeds (especially ragweed) is the most important means of preventing hay-fever. Laws to enforce the destruction of many common weeds (as the thistle, burdock, yellow dock, daisy and wild carrot and mustard) now exist in ten states.

## INFLUENZA

(*La Grippe*)

Influenza is an acute, highly contagious disease due to a special germ, and tending to spread with amazing rapidity over vast areas. It has occurred as a world-wide epidemic at various times in history, and during four periods in the last century.

A pandemic of influenza began in the winter of 1889-90, and continued in the form of local epidemics till 1904, the disease suddenly appearing in a community and, after a prevalence of about six weeks, disappearing again. One attack, it is perhaps unnecessary to state, does not protect against another.

The mortality is about one death to four hundred cases. The feeble and aged are apt to succumb. Fatalities usually result from complications or sequelae, such as pneumonia or tuberculosis. Neurasthenia or insanity may follow.

**Symptoms.**—There are commonly four important symptoms characteristic of grippe: fever, pain, catarrh, and depression—mental and physical. Grippe attacks the patient with great sud-



denness from one to three days after exposure to the contagion. While in perfect health and engaged in ordinary work, one is seized with a severe chill followed by general depression, pain in the head, back, and limbs, soreness of the muscles, and fever. The temperature varies from  $100^{\circ}$  to  $104^{\circ}$  F.

The catarrh attacks the eyes, nose, throat, and larger tubes in the lungs. The eyes become reddened and sensitive to light, and movements of the eyeballs cause pain. Sneezing comes on early, and, after a day or two, is followed by discharge from the nose. The throat is often sore and reddened. There may be a feeling of weight and tightness in the chest accompanied by a harsh, dry cough, which after a few days becomes looser, and expectoration occurs. Bodily weakness and depression of spirits are usually prominent, and form often the most persistent and distressing symptoms.

After three or four days the pains decrease, the temperature falls, the cough and oppression in the chest lessen, and recovery usually takes place within a week or ten days, in ordinary cases.

The patient should go to bed at once, and should not leave it until the temperature is normal ( $98\frac{3}{5}^{\circ}$  F.). For some time afterwards general weakness, associated with heart weakness, causes the patient to sweat easily, and to get out of breath and have a rapid pulse on slight exertion.

Such is the picture of a typical case, but it often happens that some of the symptoms are absent, while others are exaggerated, so that different types of grippe are often described. Thus the pain in the back and head may be so intense as to resemble that of meningitis. Occasionally the stomach and bowels are attacked so that violent vomiting and diarrhea occur, while other members of the same family present the ordinary form of influenza. There is a form that attacks principally the nervous system, the nasal and bronchial tracts escaping altogether. Continual fever is the only symptom in some cases. Grippe may last for weeks.

Whenever doubt exists as to the nature of the disorder, a microscopic examination of the expectoration or of the mucus from the throat by a competent physician may definitely determine the ex-



istence of influenza, if the special germs of that disease are found to be predominant.

It is the prevailing fashion for persons to call any cold in the head the grippe; and there are, indeed, many cases in which it becomes impossible for a physician to distinguish between grippe and a severe cold with muscular soreness and fever, except by the microscopic test. Thus "colds" or infections of the nose and throat with pneumonia germs (*pneumococcus*), the germ of nasal catarrh (*Micrococcus catarrhalis*) or the ordinary germs infecting wounds (*staphylococci*), may only be differentiated from grippe by microscopical examination of the secretion of the nose and throat. The treatment would be the same, however, as for grippe.

The mere presence of certain germs in the nose and throat does not necessarily indicate that they are responsible for existing disease. Many healthy persons carry about grippe germs for long periods after grippe epidemics. These carriers are sometimes responsible for fresh outbreaks of grippe.

Influenza becomes dangerous chiefly through its complications, as pneumonia, inflammation of the middle ear, of the eyes, or of the kidneys, and through its depressing effect upon the heart.

These complications can often be prevented by avoiding the slightest imprudence or exposure during convalescence. Elderly and feeble persons should be protected from contact with the disease in every way. Whole prisons have been exempt from grippe during epidemics, owing to the enforced seclusion of the inmates. The one absolutely essential feature in treatment is that the patient stay in bed while the fever lasts and in the house afterwards, except as his strength will permit him to go out of doors for a time each sunny day, until recovery is fully established.

**Treatment.**—The patient should be isolated in a room by himself. The discharges from his nose and throat should be burned, and the nose and throat should be sprayed several times daily with a good antiseptic, as Dobell's solution.

The medicinal treatment consists at first in combating the toxin of the disease and assuaging pain, and later in promoting strength. Hot lemonade and whisky may be given during the chilly period

and a single six- to ten-grain dose of quinin. Only mild cathartics are suitable to keep the bowels regular, as a Seidlitz powder in the morning before breakfast.

The diet should be liquid while the fever lasts—as milk, cocoa, soups, egg nog—one of these every two hours. A tablespoonful of whisky, rum, or brandy may be added to the milk three times daily if there is much weakness.

The germ causing grippe lives only two days, but successive crops or spores are raised in a proper medium. Neglected mucus in nose or throat affords an inviting field for the germ; therefore it is essential to keep the nostrils free and disinfected by spraying with Dobell's or Seiler's solution. It is extremely important that elderly persons, or those with weak hearts, should remain quiet in the house for some time after apparent recovery, as heart failure and death are not uncommon without such care.

In some cases many weeks are required before health is completely restored and often a trip to a more salubrious climate is advisable. Prolonged mental depression following grippe is one of its most well-known and unfortunate features.

## CHAPTER XII

### DISEASES OF THE HEART, THE BLOOD, AND THE BLOOD VESSELS

Heart disease. Palpitation of the heart. Anemia. Arteriosclerosis.

#### DISEASES OF THE HEART

##### HEART DISEASE

The heart is a hollow muscle which withdraws blood from one set of blood vessels (the veins) and pumps it into another set (the arteries), and thus keeps the blood moving about the body. Within the heart are chambers and valves to prevent the blood from flowing back from the arteries into the heart and from the heart into the veins, as the valves in a pump prevent the water from flowing back into the well when the piston is raised.

In heart disease the heart muscle is either altered in structure through the influence of poisons—most of which are produced by the germs of infectious diseases—or the valves of the heart become defective, owing to attack by germs, do not close properly and are leaky, or else become obstructed. Such defects constitute what is called “valvular disease,” which is the most common form of chronic diseases of the heart. The effect of such a condition is that the heart does not pump sufficient blood into the arteries, because it leaks back into the veins.

But there is a common provision of nature which frequently prevents such a disturbance, and this consists in enlargement of the heart and increase in its muscular power sufficient to overcome the valvular defect. When this happens, there may be so little disturbance produced by disease of the valves that the patient may be

entirely ignorant of its existence. This effort of nature is called "compensation," and it may be more or less perfect and may last a longer or shorter time.

Occasionally a person may live to a good old age with a valvular affection of the heart which has been prevented from giving any trouble by the compensatory enlargement. When the enlargement is insufficient, or when after a time the increase in muscular power caused by the enlarged heart ceases, then disturbances in the circulation appear, and are manifested by symptoms.

**Causes.**—Among all the acute diseases, rheumatic fever is the most frequent source of heart disease. Scarlet fever, tonsillitis, pneumonia, smallpox, erysipelas, blood poisoning, gonorrhea, child-bed fever, etc., are often responsible for disease of the heart—either evident at the time or occurring at a later period. While children may be born with heart defects, rarely is the tendency to heart disease inherited.

Habitual use of alcohol, syphilis, Bright's disease of the kidneys, and gout favor its occurrence. Repeated mental stress or physical overstrain favor the development of some forms of heart disease. Heart disease attacks all ages and both sexes. Valvular disease begins more frequently between the ages of eighteen and forty, and is a little more frequent in women. Arteriosclerosis, or hardening of the arteries, leads to disease of the heart in middle life. To sum up we may say that there are five usual causes of heart disease: in youth and in early adult life (1) acute tonsillitis and its accompanying rheumatism; in young adult and middle life (2) syphilis, (3) Bright's disease of the kidneys, and (4) goiter; in middle and advancing years (5) arteriosclerosis (Cabot).

Persons of middle age or past middle age sometimes feel discomfort or pain in the region of the breastbone, and the pain may extend into the neck or left arm. This trouble is usually thought to be due to indigestion, as the pain may be near the stomach. If the pain does not appear after eating, but only is felt after exertion, as in going upstairs, uphill, or in running, or is brought on by emotion—especially if there is shortness of breath—one should consult a doctor in reference to the condition of the heart.



**Symptoms.**—Shortness of breath on slight exertion; blueness of the lips, finger tips, face, and ears; and swelling of the feet are among the more common symptoms. Discomfort, pains, and palpitation of the heart, with indigestion, cough, dizziness, and fainting, are also symptoms. There may rarely be spitting of blood. Not all these symptoms are present in all cases of heart disease, and any single one of them may be characteristic of some other disorder.

In children paleness and unnatural inactivity—the child does not run about and play like other children—are usually observed. There is shortness of breath, blue lips, complaint of distress or pain about the heart, and it may be seen or felt beating violently. The digestion is disturbed, the feet may swell, or the child may be unable to lie flat and breathe comfortably.

A careful, physical examination of the heart and body, made by a physician, is essential whenever heart disease is suspected. It is impossible to form any correct opinion concerning its existence from the symptoms alone. Pains about the joints in children with or without fever should always lead parents to secure medical advice in the light of a possibility of rheumatism and its common result in leading to damage of the heart. What are improperly called “growing pains” are gouty or rheumatic danger signals.

**Treatment.**—It is impossible to outline any form of treatment which must vary according to the kind of heart disease and the individual needs. From what has been said of the frequency with which disease of the heart originates in the acute diseases, as grippe, diphtheria, pneumonia, tonsillitis, etc., the necessity of patients remaining in bed for a sufficient length of time to save the heart, and the importance of keeping the patient quiet in bed, and not allowing him to sit up during such diseases, will become evident to the reader.

Avoidance of excitement and exposure is important after attacks of rheumatic fever and of the infectious disorders. The diet should be moderate and distention of the stomach should be avoided; alcohol and tobacco must be forbidden absolutely. A patient suffering from heart disease should never drink large quantities of

fluid at one time or during the day: one-half to two-thirds of a glassful of fluid may be taken at one time.

Sudden death from failure of the heart is very rare, and the prevalent fear of such failure is unfounded.

### PALPITATION OF THE HEART

**Symptoms.**—A test of the normal condition of most of our organs is our unconsciousness of their existence. In palpitation of the heart its movements become uncomfortably perceptible, and there is an indescribable discomfort or distress over the heart; more commonly there is a beating, throbbing, fluttering, or jumping sensation. At the same time there may be a feeling of “goneness” and weakness in the pit of the stomach, or nausea with pains about the heart.

**Causes.**—Palpitation is usually due to nervous weakness, and occurs more frequently in nervous and anemic women. While in some cases the action of the heart is rapid and violent, in other cases it beats naturally and quietly when the patient imagines it is beating tumultuously. This shows that the condition arises often from unnatural sensitiveness of the patient to the action of the heart; for in true organic disease of the heart muscle, when the action is unusually strong or rapid, the patient is, in most instances, completely unconscious of it. Palpitation is then generally not a symptom of serious heart disease, but is usually significant of nervous weakness which usually admits of cure, although in some persons the trouble may persist for a long period.

Palpitation is not continuous, but there are intervals of freedom from distress. The attacks may last for a few minutes or even for an hour or more. Palpitation is seen often in women at puberty, during menstrual periods, or during the “change of life,” when the nervous system is more sensitive. Fear, excitement, grief, and anxiety may occasion it. In men, excess of alcohol, coffee, and tobacco, and in women, tea, are frequently responsible for palpitation.

Indigestion with wind or flatulence is a common cause. Overwork, nervous exhaustion, hysteria, and sexual excitement favor its occurrence. Palpitation is more apt to appear when the body as-

sumes certain postures, as lying on the left side. Exercise not rarely relieves palpitation. During an attack the increased action of the heart may be seen or felt with the hand on the chest, the face may be red, and the pulse rapid. In other cases—as has been noted—no change can be detected.

**Treatment.**—The attack may be relieved by a teaspoonful of spirit of chloroform (not pure chloroform), or one-half teaspoonful of Hoffman's anodyne, or a teaspoonful of tincture of valerian—one of these in a wine glass of water. A half teaspoonful of aromatic spirit of ammonia, or a little brandy, in cold water may be serviceable also. The brandy is not suitable for those accustomed to alcohol.

Tea, coffee, tobacco, alcohol, and sexual excitement must be avoided. The taking of a regular, moderate exercise, of ten hours' sleep, and of daily tepid or cool baths, with light meals, should be the rule. Other existing disorders which may be responsible for the palpitation, as nervous exhaustion, should receive medical attention. An examination of the heart by a physician is essential to eliminate absolutely the possibility of true organic diseases of the heart.

Treatment of a tonic nature with iron and strychnin, which can only be prescribed to advantage by the medical man, should generally be continued for some time. The application of a mustard paper, or cold compress, over the heart during the attacks will sometimes prove of value. The hourly use of sodium bromid taken in five-grain doses dissolved in one-half a glass of water, is one of the most useful remedies for nervous persons, but should not be continued for a longer period than a day at a time.

## DISEASES OF THE BLOOD AND BLOOD VESSELS

### DEFICIENCY IN QUANTITY OR QUALITY OF THE BLOOD

#### (*Anemia*)

Blood is a fluid in which float microscopic solid elements—the red and white cells.



Anemia is a condition of the blood in which either the total amount of blood is reduced, or there is a deficiency in the number of red cells, and in iron, which gives to these cells their red color. Until the microscopic examination of blood had reached the development which it now has attained, a person was thought to have anemia when the face—and particularly the lips—presented a pale or bloodless color. But the examination of the blood shows us that not all persons with pallor to a marked degree have anemia. This is notably the case with persons living in the tropics (who are not exposed to the sun), in those with nervous exhaustion, in some cases of heart disease, in morphin habitués, and often in patients with beginning consumption. Some healthy persons are always pale. Therefore it is not safe to rely upon color or even symptoms—as in nervous prostration with pallor we have symptoms common to anemia; for accuracy the blood of the pale person must be examined by a competent medical man.

Anemia is ordinarily secondary to some other diseased condition. Among these we have the following: loss of blood as from wounds, from bleeding from the stomach, lungs, piles, or from the womb; in conditions with a constant drainage from the body, as in nursing mothers, in chronic diarrhea; with discharging sores or wounds; poisons, as constant exposure to lead and arsenic, poisoning in Bright's disease, and the poisons of germ diseases, as malaria, syphilis, typhoid fever, tuberculosis, etc.; chronic digestive disorders, or starvation and cancer. Various forms of worms infesting the bowels may produce the most severe forms of anemia, and among these the minute hookworm has recently been discovered to be responsible for much of the disease in certain localities, as in our insular possessions in the Philippines and Porto Rico and in many parts of the Southern United States. The "clay eaters" of the South owe their color and condition chiefly to the hookworm. Its recognition and expulsion from the body have now become simple matters to the physician.

It will thus be impressed upon the mind of the reader that it is incumbent upon pale persons not only to have their blood examined but to employ a physician to discover and remedy the cause. There



are, however, certain individuals in whom it may not be possible to assign a cause, and there are two general classes of cases in which there is severe anemia without apparent cause. These two classes include (*a*) the "green disease" (chlorosis) of young women between the ages of fourteen and seventeen—generally those who have grown up in the city without proper air, food, and exercise, and who present a peculiar yellowish-green complexion; and (*b*) the fatal type of anemia, in which there is waxy pallor and bloodless lips and such great languor and increasing weakness that the patient is forced to remain in bed.

**Symptoms.**—Besides paleness of the skin and mucous membrane of the lip inside of the mouth and pearly whiteness of the whites of the eyes, there is the peculiar greenish-yellow complexion of the anemia of young women. In the more grave forms the skin has often a waxen or even yellowish hue, and there may be brown pigmentation about the ankles.

Among the more frequent results of anemia are fluttering of the heart and short breath on slight exertion; languor and fatigue after mental or physical work; poor appetite and disturbed digestion, with chronic constipation; headache, dizziness, and fainting, with the appearance of spots before the eyes and blurring of the sight. Cold feet and hands are frequently present. In severe cases of anemia there is excessive weakness; puffiness of the face and ankles are sometimes seen.

The skill of a physician will be required to rule out such conditions as disease of the heart or kidneys, or nervous exhaustion associated with paleness, in which the symptoms are somewhat similar. The outlook is usually favorable in the anemia secondary to other diseases, which can be remedied, and also in the form of "green disease" peculiar to young women.

**Treatment.**—The treatment consists, in a general way, in following an out-door life, especially in high altitudes; in eating good, nourishing food, particularly meats, milk, eggs, and green vegetables; in having a good movement of the bowels daily by means of a teaspoonful (more or less) of Epsom salts in a glass of cold water on rising, and in the use of iron in the form of Bland's pills. Two

of the five-grain Blaud's pills may be taken three times daily, after meals. Arsenic is valuable, notably in the more severe cases, but should be taken only under the physician's directions.

## DEGENERATIVE CHANGES OF AGE

### ARTERIOSCLEROSIS

#### *(Hardening of the Arteries)*

Cazalis said: "A man is as old as his arteries." This is now an axiom in medicine. Arteriosclerosis, while it means hardening of the arteries, also means thickening of the arteries and lessening of their caliber so that a greater pumping force of the heart is required to distribute the blood through the vessels.

This disease of the arteries is four times more common in men than in women. It occurs usually after fifty in men and a decade later in women. The change in the vessel is due to overwork of the vessels. The arteries which are worked the hardest are the first to become diseased. Thus in the manual worker, the arteries in the arms and legs are thickened; in the mental worker the arteries in the brain and heart are chiefly affected.

The function of arteries is to dilate and contract. When such changes are too excessive, and occur too frequently, or for too long a period, hardening is apt to follow.

We think of the heart as never stopping, but the heart sleeps longer than the brain. This is explained by the heart's rest periods which alternate with its contractions or beats. When the times occupied by the rest periods are added together, we find that the heart rests thirteen hours and works eleven hours out of the twenty-four. Now during the rest periods of the heart the circulation is carried on by the elastic recoil of the arteries, which dilate during the contraction of the heart, but contract during the rest period of the heart, when that organ is filling with blood. The arteries, therefore, act as veritable motors. By means of the nervous system the arteries regulate the supply of blood to a part—as seen in the flushing or pallor of the skin. There is never enough blood to fill all the blood vessels

at the same time throughout the body. The nervous system is the stopcock which, by dilating or contracting the arteries, apportions the amount of blood needed by different organs in the body at any given time.

In physical or mental work, excitement or worry, the vessels dilate—in the limbs in physical work, in the brain in mental activity by increased action of the heart. Contraction is necessary to restore the caliber of the arteries, and when this elastic power gives out nature tries to compensate by causing thickening of the arteries through a growth of new tissue in them.

**Causation.**—In the manual laborer hard physical work will cause arteriosclerosis, but as it is more apt to occur in the limbs, it is not so dangerous. In men in easy circumstances, overeating, hard drinking, and excessive smoking, with too little exercise, are common causes. Most men over forty, and in good circumstances, overeat. Obesity favors thickening of the arteries by obstructing the vessels and by putting too much work on them and the heart in overcoming the obstruction. One hears much now-a-days about high blood pressure. High blood pressure may ultimately lead to thickening of the arteries in nature's attempt to strengthen the blood vessels. Again, thickening and narrowing of the arteries increases blood pressure—a vicious circle.

Blood pressure is measured by the amount of pressure which is required to obliterate an artery so that its pulsations cease. It actually means the pressure exerted by the blood against the walls of the blood vessels. The arteries in the abdomen are chiefly responsible for the state of blood pressure, as they act as a reservoir of blood.

Since these vessels are rarely thickened by disease it happens that blood pressure may not be necessarily high in arteriosclerosis. Indeed, according to Sawada, only twelve per cent. of cases of arteriosclerosis have high blood pressure, excluding those with kidney disease.

High blood pressure is a warning, as in time it may lead to thickening of the vessels and damaged heart and kidneys. *Every individual over forty should have occasional examination of his blood pres-*



sure by his family physician. If a thorough general examination of the body were made annually, of all persons over forty-five, life could be much prolonged. Many cases with high blood pressure can recover perfect health by proper living. Certain diseases causing poisons in the blood, as typhoid fever, syphilis, and gout, provoke arteriosclerosis.

Poisons generated by delay of the intestinal contents (stasis) in constipation induce the disease. There is great difference of opinion regarding the influence of alcohol and tobacco in causing hardening of the arteries. It is simply a question of *how much* harm they do.

Some persons inherit strong tubing or vessels; these are apt to achieve longevity. In others the reverse is true, although most cases of arteriosclerosis are due to abuse of good blood vessels.

The quiet life with moderate eating and drinking tend to prevent the change, but with old age, arteriosclerosis is natural and to a certain extent conservative in compensating for the loss of elasticity of the vessels. Worry, anxiety, and mental excitement, strain the blood vessels of the heart and brain, increase the rapidity of the heart, and thus overfill the vessels of the brain by the forcible action of the heart.

**Symptoms.**—The symptoms may not appear for years after the occurrence of arteriosclerosis. This is the reason for making routine examinations of the patient. Dizziness and ringing in the ears are suggestive symptoms in persons of middle or advancing life.

Frequency of passage of urine at night, shortness of breath on exertion, gas in the stomach, dyspepsia, constipation, cold hands and feet, and pain in the middle of the chest, sometimes occur. The symptoms are diverse and the diagnosis cannot be made without a thorough examination. The disease terminates in advanced cases in apoplexy, or in heart or kidney disease, in most instances.

**Treatment.**—After anatomic change in the arteries has once occurred nothing can restore them to a normal condition. Treatment is directed toward preventing or limiting progress of arteriosclerosis, when it has arrived. Prevention means proper living. This means a reduction of the amount of food in those of overweight. Meat may be taken only twice a week, in moderate amount, and fish twice,



a week. A milk, egg, vegetable and fruit diet, including all bread-stuffs and cereals, is the most useful. Alcohol should be avoided wholly in all its forms, with few exceptions. Smoking should be stopped, or curtailed to one mild cigar after dinner. It is well to drink not more than one cup of coffee daily, and that from which the caffeine has been extracted.

Not over three pints of liquid, including all kinds, should be taken in twenty-four hours. Overfilling the blood vessels with fluids increases the blood pressure and work of the heart. Sleep is important, and may be encouraged by a warm bath (not hot) before retiring. For elderly persons who awaken early a daily nap is advisable. Cold baths are injurious in increasing blood pressure. Warm baths ( $100^{\circ}$  to  $105^{\circ}$  F.) of five minutes' duration daily are most useful in relaxing blood vessels. The avoidance of cold climates and high altitudes is advisable, as both favor a high blood pressure. Chills should always be especially avoided by wearing woolen clothing. Chills cause contraction of the superficial vessels and favor congestion of the kidneys. Regular daily exercise is of the greatest importance when the heart is not damaged too much.

Waste matters in the blood are burned up in the tissues more readily by exercise. Golf, horseback riding, walking, and moderate outdoor work are most useful; heavy work and severe exercise, as tennis, are injurious. Fat, especially in the region of the belly, is harmful. The circulation in the vital organs is interfered with by fat, and also the movements of the heart, diaphragm and lungs. Special exercises, given under the supervision of a doctor, together with a suitable diet, will reduce abdominal fat. It is not at all essential to give up regular work; on the contrary, work is necessary for good health, and it is proverbial that many men begin to lose ground as soon as they retire from active work. Only work should be free from excitement, worry and anxiety.

It is most important that the bowels move freely. Old age is favored by an accumulation of waste matters in the system. We have seen that absorption of poisons following the delay of intestinal contents is one of the recognized causes of arteriosclerosis. Diminishing the daily quantity of food favors constipation. To offset this

mix an equal bulk of bran and agar-agar, cut into one-half inch pieces; a handful of the mixture should be taken each morning for breakfast. The mixture should be moistened with hot water, flavored with salt, and eaten with sugar, without any cooking. The bran is kept in packages by grocers, the agar-agar by druggists. The bran (Ralstons) is practically sterilized ordinary wheat bran, and acts by stimulating the bowels. The agar-agar is an Asiatic seaweed and swells in the digestive tract, but is not absorbed. It acts by supplying the bulk. The amount of salt taken by subjects of arteriosclerosis should be small.

In a book such as this the chief object is teaching prevention of disease. The measures herein suggested should be applied before symptoms appear, and consist in proper living. When symptoms occur one should seek the advice of his medical man. It is not possible to suggest any cure for symptoms of arteriosclerosis; only a physician can do that as the result of a careful examination, by applying remedies to fit the particular case.

## PART III

### CHAPTER I

#### VOMITING AND JAUNDICE

Vomiting. Sea sickness. Car-sickness. Vomiting of blood. Jaundice. Biliousness.

#### VOMITING

Vomiting is not a disease but a symptom of disease, and the causal disorders are numerous.

**Causes.**—Acute indigestion (gastritis) is the most common and least serious cause of vomiting. This usually is produced by the eating of food which has begun to decompose and is laden with harmful germs. It is a form of food poisoning wrongly called ptomain poisoning. Milder forms of acute dyspepsia may be caused by eating indigestible food or too great quantities of food. In the vomiting of indigestion other symptoms are present, as pain or discomfort in the stomach or bowels, bad taste in the mouth, coated tongue and nausea, headache, depression of spirits, drowsiness, and diarrhea or constipation. Occasionally there may be some fever (101° F. to 102° F.); the attack lasts a few days.

Vomiting with severe pain in the belly is often seen in acute appendicitis, gall-stones, stone in the kidney, strangulated rupture, and other conditions described elsewhere in this volume.

Vomiting daily (with pain in the stomach, acidity, and gas) coming on regularly from one-half to three hours after eating, signifies ulcer of the stomach, especially when the pain is relieved by vomiting. Vomiting of blood indicates ulcer of the stomach if the symptoms of ulcer, just noted, have existed before the hemorrhage—

otherwise vomiting of blood from the stomach usually means some other trouble, as heart disease, etc.

Vomiting, when the stomach is empty, speaks for some cause of irritation outside of the stomach, as from nervous disorders, poisoning by Bright's disease, or irritation in any part of the body. Morning vomiting is more frequently due to pregnancy, abuse of alcohol, tobacco smoker's catarrh of the throat, Bright's disease, and nervous disorders.

Frequent attacks of vomiting of food, ten or more hours after it has been eaten, indicate spasm or obstruction of the outlet of the stomach. Chronic vomiting directly after eating may be due to spasm or obstruction in the gullet. Periodic attacks of vomiting with colic, distention of the bowels, and obstinate constipation strongly suggest chronic obstruction of the bowels.

Vomiting following a one-sided headache, and without symptoms of indigestion, signifies a sick headache (migraine). In these cases there is a history of repeated attacks, and the disease is often inherited.

Vomiting is frequently seen in the beginning of acute diseases, as influenza, smallpox, scarlet fever, pneumonia, malaria, etc.; but here the presence of fever, pain in the head and back, perhaps sore throat or eruption, will point to other cause than stomach trouble.

Vomiting is quite frequently a disturbance of the brain. That produced by eye strain, by fatigue, emotion, fright, and severe pain is due to this cause. Also vomiting, accompanied by dizziness, noises in the ear, and deafness, may be classed under this head, as there is disorder of the nerve of hearing or its brain center. Vomiting and persistent headache are the most prominent symptoms in brain tumor, and also in meningitis with fever, stupor, delirium and unconsciousness.

Vomiting is common as part of such nervous disorders as nervous prostration, hysteria, and the more serious locomotor ataxia.

Vomiting is the most notable symptom after swallowing of most poisons, as is seen after overindulgence of alcohol. The poisons in the blood produced by disease are ordinary causes of vomiting,



as those of Bright's disease, diabetes, pregnancy, of sick headache, of oversecretion of the thyroid gland in goiter, and in periodic vomiting in children (cyclic vomiting).

The swallowing of foreign bodies produces vomiting, which may not cease until after they are expelled from the bowels, as is sometimes seen when children swallow coins. Tumor or inflammation of any of the abdominal organs will frequently cause vomiting. Severe cough of any kind may lead to vomiting, and it is seen frequently in whooping-cough and in consumption. Both sea sickness and car sickness are well-known forms of vomiting.

**General Treatment of Vomiting.**—The patient should wash out his stomach by swallowing a pint or two of hot water and, after vomiting it, repeat the process several times. Also a quart or two of warm soapsuds should be injected into the bowel to move the bowels satisfactorily. Most cathartics will be vomited but an adult may swallow two or three compound cathartic pills, and a baby or child may be given a tablet of one or two grains of calomel to advantage. The patient should rest quietly on his side in bed, and a mild mustard paper may be placed over the stomach.

No food should be taken for twelve to twenty-four hours, or until the nausea and vomiting cease. A tablespoonful of cracked ice with a few drops of brandy may be taken occasionally, or—if more agreeable—hot water may be sipped to relieve the thirst. When vomiting stops the patient may take a tablespoonful every two hours of one of the following: milk and lime water, or milk and ice cold Apollinaris water, equal parts; clam juice; beef juice squeezed from a lightly broiled steak; or white of egg, stirred into one-half cup of cold water and flavored with a few drops of lemon juice. After a few hours the amounts may be increased if the patient retains the food satisfactorily.

In persistent vomiting, tablespoonful doses of iced, dry champagne will sometimes be borne better than any other nourishment. Among drugs, the tasteless, white powders, bismuth subnitrate, in one-third teaspoonful doses, with cerium oxalate in five grain doses, are most successful in relieving vomiting. They should be dropped dry on the tongue in the above doses every four hours. The diet

may be extended to cereals, toast, soft egg, etc., as improvement takes place.

#### SEA SICKNESS AND CAR SICKNESS

Persons about to take a sea voyage should abstain from unnecessary fatigue in shopping, packing, farewell festivities and dinners, so as to keep in good condition, and take fifteen grains of sodium bromid with one-tenth grain of ipecac in a glass of water after meals, three times daily during the two days before and after sailing. There should be a free movement of the bowels each morning during this time, for which purpose a glass of citrate of magnesia or other aperient water should be taken. When on shipboard the voyager should lie down, warmly covered, on deck, or, if having an airy stateroom, go to bed, and avoid smells, sounds or moving objects—as the water or movements of the vessel. The eyes may be kept closed with this in view.

Iced, dry champagne, or two tablespoonfuls of brandy in a glass of cracked ice, may be taken in tablespoonful doses at half hour intervals to relieve vomiting, should it occur. A hot water bag at the feet and mustard plaster over the stomach are also serviceable in severe attacks, in which it may be necessary to have hypodermics of morphin and atropin administered by a doctor. A dose of eight grains of veronal may be beneficial. For the treatment of vomiting in pregnancy and alcoholism, *see* special articles on these subjects.

#### VOMITING OF BLOOD

Blood from the stomach is usually dark or brownish, owing to the action of the acid in the gastric juice upon it; but occasionally it is quite red. It is usually accompanied by retching and vomiting and may be mixed with food. There may be difficulty in distinguishing blood from the nose or throat, which has been swallowed, from that arising from bleeding of the stomach. Blood will usually be seen about the nose in nosebleed, and in bleeding from the stomach there will usually be a previous history of pain in the stomach and indigestion. Or in bleeding from the stomach there may be disease of the heart, spleen, liver, or fever, which sometimes produce such a result.

Bleeding from the stomach must also be discriminated from hemorrhage from the lung which is usually (but not always) brought on by coughing, or causes coughing, and the blood is bright red, alkaline, often frothy, and accompanied perhaps by known disease of the lungs or heart. Fainting is common after vomiting of a large amount of blood in ulcer, but death occurs in but one case out of ten in ulcer of the stomach (Lockwood).

**Treatment.**—The patient should be put to bed, with the foot of the bed raised a foot or so, and an icebag kept continuously over the stomach. The patient should not be permitted to talk, and all food or drink by the mouth should be withheld. The best remedy, if it can be obtained, is adrenalin solution (1 to 1,000) given in five drop doses each half hour in a little cracked ice and water.

Of course a physician should be summoned as soon as possible. A quart of warm water, containing a heaping teaspoonful of salt, may be injected very slowly into the bowel from a fountain syringe hung some four inches above the patient, so that it will be absorbed and retained.

For three to five days after the bleeding has ceased no food or water should be given by the mouth. The mouth may be washed frequently with listerine or saturated solution of boric acid (as much as will dissolve in cold water) and, if there is much thirst, a solution of baking soda (one level teaspoonful to the quart of water) may be allowed to flow slowly into the bowel once or twice daily, so as to be retained. On the fourth day the patient may have peptonized milk, and water containing five grains of baking soda—of each four teaspoonfuls, giving first one and then the other hourly (*See Ulcer*).

In severe hemorrhages from the stomach the physician will advise the injection of blood from another healthy individual into the blood vessel of the patient as the most life-saving treatment.

**Causes.**—Vomiting of blood is a symptom of many conditions, as has been suggested. Coming on in young women, or in patients who have suffered from pain at regular times after eating, with acidity and perhaps gas, it is apt to be due to ulcer. Cancer of the stomach is a frequent cause in persons of middle age or past but



the bleeding is not apt to be profuse. Blows, kicks, and injuries to the belly wall may cause hemorrhage from the stomach. Swallowing of blood from nosebleed, especially if occurring during sleep, may lead to vomiting of blood in the morning. After operations, as for adenoids or extraction of teeth, vomiting of blood is common but would not be apt to cause doubt as to the source.

Disease of the heart, liver, spleen, scurvy, yellow fever, small-pox, measles, severe anemias, influenza, dengue, purpura, chronic appendicitis and gall-bladder trouble, occasionally produce vomiting of blood. In women it rarely appears in place of normal menstruation. Finally it sometimes is seen in persons without any apparent cause and in whom it never recurs. Taking cases due to all causes, patients rarely die while vomiting blood or directly from it.

## JAUNDICE

**Causes.**—There are many causes of jaundice, but the commonest form described here is due to an attack of acute indigestion or catarrh of the stomach and first part of the bowel.

As a result of this catarrhal inflammation, the lining mucous membrane of the intestine becomes swollen, and in this way obstructs the opening of the tube (common bile duct) which conveys bile from the liver into the bowels. The opening of this bile duct in the intestine is about three or four inches below the point where the stomach ends and the bowel begins (Fig. 57, B). Not only is the bile duct closed by swelling of the mucous membrane about its aperture in the bowel, but this opening is often plugged with mucus which is being secreted from the inflamed area. Jaundice is the direct result of this plugging and obstruction of the bile duct. Since the bile is prevented from flowing into the bowel, as it naturally should, it backs up into the ducts of the liver until it is reabsorbed into the blood. The result of this is that the skin and whites of the eyes are tinged from pale yellow to olive or greenish-black, and the urine dark brown, while the bowel discharges, being deprived of bile, become light colored or almost white.



Simple catarrhal jaundice occurs more often in the young previously healthy persons, and usually follows an attack of acute indigestion; but it may be caused by exposure to the cold, or fright, and it may accompany malaria and other diseases. It is sometimes seen as an epidemic in spring and fall.

**Symptoms.**—The jaundice, or yellow appearance, sometimes comes on without any previous warning or discomfort, but generally such symptoms as the following may appear several days, rarely a week or two before the jaundice is noticed. There is loss of appetite, nausea, a feeling of heaviness and distress in the region of the stomach some hours after eating, and perhaps discomfort in the right side; there is a bad taste, and the tongue is coated. In severe cases there are headache, pains in the back

and limbs, and fever, the temperature rarely rising over 102° F. at the onset. The pulse, however, is usually slower than normal.

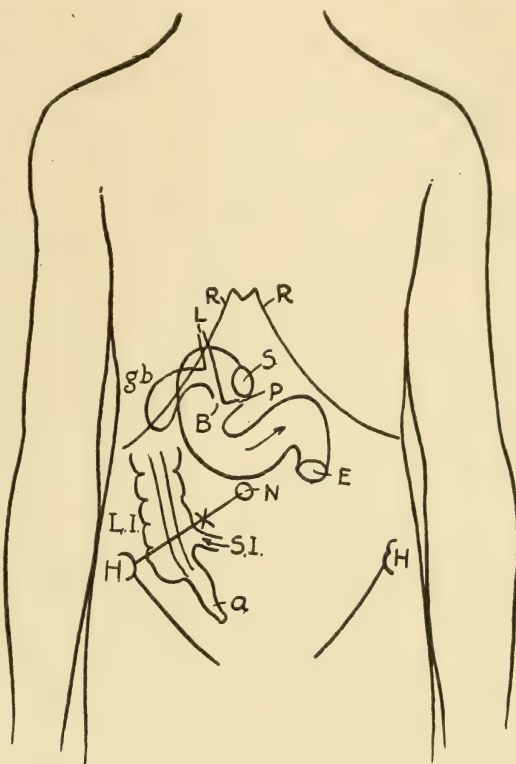


FIG. 57.—POSITION OF GALL-BLADDER AND APPENDIX.

R R Lower border of ribs. S Beginning of small intestine (duodenum) at outlet of stomach. Seat of duodenal ulcer in first inch of duodenum which ends at E. gb Gall-bladder under border of ribs, right side. B Site of entrance of common bile duct in duodenum which is formed by duct from liver (L) uniting with duct from gall-bladder and duct from pancreas, a large gland at P.

H H Bony prominences at forward and upper part of hip bone. N Navel. Midway in an imaginary line drawn from the navel to H on the right side is the point of tenderness on deep pressure in appendicitis at X. A Appendix. This begins in reality about 2 inches below the point of tenderness and pain in appendicitis and hangs down still lower in the abdomen. LI Large intestine beginning at SI, where the small intestines terminate in the large.

**Diagnosis.**—The appearance of jaundice following an attack of indigestion in young healthy persons without the occurrence of severe pain, is strongly indicative of catarrhal jaundice, just described. The graver forms of jaundice are more apt to be present in middle or advanced age and include more frequently jaundice due to obstruction produced by two diseases—gall-stones and cancer.

Jaundice from gall-stones is three times more common in women than in men. When there is a history of sudden and severe attacks of pain in the region of the stomach, occurring before the appearance of jaundice, one may be reasonably sure of the presence of gall-stones. Jaundice produced by cancer is usually the result of prolonged irritation of the gall-bladder and bile ducts by gall-stones. Attacks of severe pain may precede and accompany the jaundice of cancer in persons of middle age or past middle age. Persistent jaundice and emaciation are characteristic of cancer of the gall-bladder and liver.

There is another form of jaundice, not uncommon in newborn children, which appears about the third or fourth day of life and lasts for about a week or so, and is characterized by some loss of weight, general yellowness, and the passage of dark-colored urine. This is a harmless condition and needs no treatment. There is, however, a rare form of jaundice in the newborn which is accompanied by great emaciation and is often fatal, being due to changes in the structure of the liver. The doctor must be called in to establish the difference here.

Catarrhal jaundice lasts two weeks in mild cases, four and even twelve weeks in the more severe. If it persists beyond this time it is apt to be not of the catarrhal form, but of some more serious variety indicative of liver disease.

**Treatment.**—If there is any fever (the temperature above 99° F.) or much weakness and general discomfort, the patient should go to bed; otherwise he may safely keep about. But the requisite diet is not conducive to work. This should consist at first of skim milk, meat broths free of fat; or white of egg beaten up with about six times its bulk of cold water, and given when the froth subsides, flavored with a few drops of lemon juice. Some such

nourishment should be given every two hours of the day, with occasionally milk toast, crackers, or a bland cereal like wheat-flour or cornstarch gruel.

The bowels should be moved freely every day with a tablespoonful of Epsom salts dissolved in as little water as possible, and followed immediately by a whole tumblerful of pure water. Instead of Epsom salts, the daily use of Seidlitz powders, citrate of magnesia, Hathorn water, Hunyadi János, or Carlsbad salts, may be more agreeable; the cathartic should always be taken early in the morning before eating.

As the feeling of discomfort from the indigestion disappears and the passages from the bowels regain a natural color, the diet may be extended to lean meat, chicken, fish, cooked vegetables, such as mashed or baked potatoes, peas, string beans and spinach, and cooked fruits. Much water should be taken throughout the disease, particularly Apollinaris or soda water, if possible.

Daily injections of a pint of cold water into the bowel, to be retained as long as possible, are useful. Itching is relieved by bathing the skin with tepid water containing a teaspoonful of baking soda, or half a teaspoonful of carbolic acid in half a pint of alcohol and hot water, or in a pint of hot water alone.

## BILIOUSNESS

**Causes.**—This is a vague term describing, not an exact condition of the body, but, in an indefinite way, a group of symptoms. It is probable that there is some acute indigestion or more or less catarrh of the stomach and first part of the bowel, in many cases, and that poisons, developed by the decomposed food in the stomach and bowels, are absorbed into the liver, and derange that organ so that symptoms of indigestion and liver disturbances result. Persons having gall-stones, or inheriting gouty tendencies, are frequently subject to biliousness.

**Symptoms.**—There is loss of appetite, languor, headache, or dizziness, and depression of spirits. The tongue is coated with often

a yellowish hue in the center, and there may be a bitter taste. Constipation is the rule. The whites of the eyes are apt to become slightly yellow, and the skin sallow. Sometimes after several days of such symptoms, a violent headache comes on with nausea and vomiting followed by relief.

Biliousness is more frequent in autumn and spring. It arises in some persons from eating special articles of food, as eggs, milk, and coffee. Probably the fat in these substances disturbs digestion. In most cases of biliousness we see neither the marked symptoms of bile absorption, as the white bowel discharges and pronounced yellowness of jaundice, nor the characteristic signs of acute indigestion with the tenderness of the stomach and vomiting, but the condition is like a mild admixture of both these disorders.

**Treatment.**—The avoidance of certain articles of diet may secure freedom from the trouble. Measures calculated to overcome constipation are useful, such as exercise, especially horseback riding, performing movements for fifteen minutes each morning, in which the body at first erect, with the hands held directly overhead, is bent from the hips forward until the finger tips touch the floor, and the body swayed at the hips from side to side (except in gall-stones). Rowing and bicycling are excellent; also massage of the abdomen. An occasional dose of calomel, not oftener than once a week when the symptoms are felt to be approaching, is useful: two or three grains should be taken followed in six hours by a Seidlitz powder or a tablespoonful of Epsom salts in a glass of water.



## CHAPTER II

### CHRONIC STOMACH TROUBLES

Gall-bladder disease. Ulcer of the stomach and duodenum. Cancer of the stomach. Chronic appendicitis. Enteroptosis. Atony. Nervous indigestion.

We have used the term "stomach trouble" advisedly because its very indefiniteness enables us to establish a variety of diseases which are commonly called stomach trouble by the patient. It is extremely important to separate the functional from the organic diseases—that is, to know when we are dealing with the disturbance of the normal functions of the digestion, and when there is actual structural alteration of the organs of digestion.

When pain is real and severe, the disease is apt to be organic whether the pain be of a griping, boring, cutting, cramplike, burning or gnawing character. In functional diseases the complaint is more often of a feeling of weight, pressure, fullness, heaviness or discomfort in the belly, and nausea.

The discomfort caused by functional disease is not usually severe enough to keep the patient awake at night. In many organic diseases of the digestive organs the pain is felt only at certain periods with intervals of weeks, months, or even years of good health. In functional disease the discomfort is more apt to be more or less constant. Of course no hard and fast rules are possible and there may be exceptions to those just given. Then again the subjects of that form of faulty development, known as enteroptosis, are more prone to have functional than organic disease of the digestive apparatus.

We may classify all so-called stomach troubles as follows: One-third are caused by faulty development, or enteroptosis. This group

includes atony and nervous disorders of the stomach, because, as will be seen in the following pages, these three conditions are associated. Another third of chronic stomach troubles is due to general diseases, as consumption, Bright's disease, anemia, and various other disorders. Of the remaining thirty-three per cent. of chronic stomach troubles only one-third, or ten per cent. of all chronic stomach troubles, consists in organic disease of the stomach itself—which includes ulcer and cancer of the stomach. The final twenty per cent. of all stomach troubles are produced by disease of the gall-bladder, appendix, duodenum (ulcer of), and of other organs in the belly outside of the stomach. Disturbance of the nervous connections of these organs with the stomach leads to disorder of the stomach itself, and this becomes most apparent to the patient. Finally, we emphasize the fact that only about ten per cent. of all chronic troubles are actual diseases of the stomach itself (ulcer and cancer), while ninety per cent. are disturbances of the stomach due to diseases of other organs.

#### GALL-BLADDER DISEASE

This is very common and occurs three times as often in women as in men, and usually in middle life. Gall-bladder disease means commonly an inflammation of the gall-bladder with or without the presence of gall-stones in the gall-bladder. Gall-bladder trouble most frequently is caused by typhoid fever or appendicitis, either of these having occurred years before.

The gall-bladder is of much the size and shape of a large pear with the big end below and resting under and a little beneath the lower rib on the right side of the abdomen, and directly below the nipple of the right breast (Fig. 57 gb). Gall-bladder disease is almost always called stomach trouble by the patient and often by the doctor as well.

**Symptoms.**—It often begins with sudden attacks of gas and upward pressure in the stomach, coming on at irregular times after food and relieved by constant belching of gas and by the spitting or vomiting of food. There may be intense burning in the throat from acid brought up.

This lasts but a short time and passes away gradually, without treatment, the patient remaining perfectly well between the attacks, which may be weeks or months apart. Occasionally bilious attacks, with vomiting of bile, may be the first sign of gall-bladder trouble.

The well-marked attacks of gall-stone colic are those beginning with sudden and violent pain in the stomach, the pain being also felt to the right of the stomach under the ribs, and in the right shoulder blade. There are frequent belching of gas, nausea, and vomiting and, after some time, the terrific pain passes away as suddenly as it came, without any treatment.

These attacks come on at irregular times day or night, without any relation to meals, and they begin and end suddenly without any apparent reason for either onset or end. The eating of a very large meal may precipitate an attack, however. The attacks may be months or years apart, and in the interval the patient may be perfectly well.

Another form of gall-bladder disease is shown by persistent dull pain which is felt both in the stomach and over the lower part of the right side of the chest in front. This pain is increased by eating, exercise, or deep breathing. This form is often mistaken for pleurisy. Such attacks may last for days or weeks, and in the intervals the patient may feel in partial or perfect health.

Jaundice after an attack of abdominal pain is almost certain evidence of gall-stones—but is often absent. The shortness of the attacks in most cases of gall-bladder disease, and the comparative health between the attacks, serve to separate gall-bladder trouble from true disease of the stomach. Sometimes, however, there may be fairly continuous pain in the stomach with gas and food coming up into the mouth. The real test in these cases is pressure of the finger tips hooked up under the ribs on the right side, directly under the nipple, while the patient takes a long breath. Marked tenderness here, as compared with that on the other side of the belly, in the same relative position, is a pretty sure sign of gall-bladder inflammation.

**Treatment.**—If gall-bladder disease or gall-stones are neglected, serious consequences may follow, but there is usually no immediate

necessity for operation as in the case of appendicitis. In fact in acute inflammation of the gall-bladder and in complete obstruction of the main bile duct for stone, it is often better to postpone surgical operation until the acute trouble subsides.

The chief dangers likely to follow gall-bladder disease include abscess, perforation and gangrene of the gall-bladder (these complications are rare but demand instant operation), general inflammation of the bile passages throughout the liver (cholangitis), and obstruction to the flow of bile from the liver to the bowels owing to the presence of a gall-stone in the common bile duct. The existence of chronic inflammation of the gall-bladder (with or without stones) for years may result in degeneration of the heart or kidneys, or both, from the constant entrance of germs (living in the gall-bladder) and their poisons into the blood and their dissemination to these organs. Constant irritation of the gall-bladder by gall-stones may lead to cancer of the gall-bladder, and permanent damage to the heart, kidneys, "rheumatism" of joints, and severe headaches, are common results of long-standing gall-bladder infection.

The treatment of gall-bladder disease, whether gall-stones are present or not, is essentially surgical. In acute inflammation of the gall-bladder, a complication of typhoid fever and other infections, only medical treatment is usually advised.

The writer is aware that many leading medical men preach the harmlessness of gall-stones, when they are not producing pain, but he believes the surgeon who actually sees the various conditions caused by gall-bladder disease, is much better fitted to judge of the necessity of surgical operation. Even the most skilled medical men must guess as to the exact condition of any patient with gall-bladder disease, whereas the surgeon knows, in the case he operates upon. The opinion of the man who constantly knows is better than the man who constantly guesses. When the physician is able to follow his patient to the operating room he will hold the same views as does the surgeon.

Leading surgeons do not believe that gall-stones are harmless, even though patients harbor them for years, and die of other diseases. They are a greater menace to life than an operation by a competent



surgeon. No medicine will dissolve or remove gall-stones from the body—they can only be surely removed by the surgeon. It is true that they sometimes escape into the bowels, and thus from the body; but commonly many more remain and, if symptoms still occur, it is because of the gall-stones remaining or the inflammation, which they have caused, persisting. Chronic inflammation of the gall-bladder, with or without stones, is best treated surgically—in most cases by removal of the gall-bladder.

The operation of removing gall-stones without removing the gall-bladder has fallen in disrepute because the trouble, in most cases, returns within a few years. The gall-bladder—like the appendix—is a useless organ and may be removed without interfering with the flow of bile from the liver into the bowels (*See* Fig. 57 gb).

The danger from operations on the gall-bladder and bile ducts is slight in the hands of skillful surgeons. In simple cases of gall-stones the mortality is less than one in two hundred operations, and in operations involving the more complicated diseases of the gall-bladder and bile ducts the danger is not great. In four thousand operations of all kinds on the gall-bladder and bile passages including those of cancer, performed by the Mayo brothers prior to 1911, the mortality was 2.75 per cent.

In the attacks of violent pain caused by gall-stones, nothing is so effective as morphin<sup>1</sup> given by syringe under the skin, by a physician. From one-quarter to one-half a grain of morphin is necessary to give relief. The application of flannel cloths to the region of the stomach, wrung out in turpentine and then in hot water, is of value. Three thicknesses of flannel about one foot square, and covered with rubber cloth, or oil silk and a hot water bag, are desirable.

In case a doctor cannot be secured, and the attendant is unfit to give morphin under the skin, one may give an adult patient with the agonizing pain of gall-stone colic a teaspoonful of paregoric<sup>1</sup> every fifteen minutes for three or four doses, or a single dose of ten drops of laudanum,<sup>1</sup> or one-quarter grain of morphin<sup>1</sup> in water.

<sup>1</sup>Opium (including morphin, paregoric and laudanum) is a powerful drug and is only sold on a doctor's prescription.

These amounts should not be repeated without a doctor's advice. But these may cause vomiting, and the action of these medicines is very slow and unsatisfactory compared to giving morphin under the skin.

No cathartic, food, or drink should be given patients for twenty-four hours after an acute attack. After this time an enema should be given and tea and toast allowed.

The medical treatment of gall-bladder disease, with or without gall-stones, tends to lessen inflammation of the gall-bladder. Indeed, the pain produced by gall-stones is either caused by the inflammation of the gall-bladder they set up or by the gall-stones entering the bile ducts where the spasm provokes great pain. The exponents of medical treatment believe that if the inflammation of the gall-bladder and ducts can be relieved, the gall-stones may remain without danger to the patient. But the constant presence of gall-stones is always a menace to life and health, and medical treatment in inflammation of the gall-bladder is usually a failure.

The best treatment consists in the taking of a teaspoonful, or less, of artificial Carlsbad salts in a whole glass of hot water one-half hour before breakfast and an hour before dinner. If the cathartic action is too great the amount of salts should be diminished. Greasy and acid food, as acid fruits and vegetables, should be avoided, and no severe exercise should be taken for a year after a severe attack of gall-stone colic. A daily enema, containing a teaspoonful of salt in a quart of water, and taken so slowly that it be retained, is useful when there is jaundice. The itching caused by jaundice is relieved by warm baths and powdered starch on the skin.

#### CHRONIC ULCER OF THE STOMACH AND FIRST PART OF THE BOWEL

##### *(Duodenum)*

This disease in most cases involves the outlet of the stomach or first three-quarters of an inch of the beginning of the bowel (duodenum, Fig. 57, S). There is usually a round, raw area ranging from the size of the end of a lead pencil to that of a nickel. If the ulcerated spot is larger than one-quarter of a dollar it is usually a cancer.

An ulcer is a crater, and as clearly defined as though someone had punched out a portion of the stomach or bowel wall without quite going through the whole thickness. The ulcer may in time, however, eat entirely through the wall into the abdominal cavity (perforation).

The disease often begins in youth, and exists for years before it is clearly recognized. At one of our largest clinics it has been found that patients have been sufferers with ulcer for about ten years before they present themselves for surgery. It is more commonly seen in the middle aged and, unlike gall-bladder disease, it is three times more common in men than in women.

**Symptoms.**—Symptoms begin with a feeling of weight and fullness in the stomach and belching of sour matter one-half to three hours after meals. The attacks last weeks or months, and are followed by periods of weeks, months, or even years in which the patient feels perfectly well. He is more apt to be well in summer and attacks are more common in spring and fall, or following the wetting of the feet, or getting tired or worried, or after an indigestible meal.

The more characteristic symptoms are: At first after the heartiest meal, and later one-half to four hours after every meal, there is a colicky, gnawing, boring, or burning pain, with distention, and a hungry, sour feeling in the stomach; this has been called "hunger pain" because it is associated with hunger and is relieved by eating, drinking, by alkalis (as baking soda or saleratus), and by vomiting. There is usually much eructation of gas and often bitter or acid fluid comes up into the throat and mouth and causes burning in the mouth and chest. The pain is commonly most severe in the middle of the night and the patient will often go to bed with a cracker, cookie, or glass of milk by the bed to relieve his suffering. The constant acidity of the mouth may corrode the teeth. Vomiting may or may not be frequent. Often the subject forces his finger down his throat to bring on vomiting and thus secure relief.

The most essential features are the regularity with which the pain occurs—from one-half to four hours after eating—and the

relief obtained by drinking much fluid to dilute the acid, or by taking soda or magnesia to neutralize the acid, or by getting rid of the acid through vomiting. When the pain is severe there may be tenderness over the pit of the stomach, or more often, somewhat to the right of this point. Vomiting of blood or its passage from the bowels occurs in about one-third of the cases of ulcer.

If the patient has previously suffered from the symptoms just described the loss of blood from stomach or bowels is positive proof of ulcer. When these preliminary symptoms are wanting the diagnosis of ulcer is improbable even with such hemorrhages. When blood is passed from the bowels it is usually of a dark, tarry appearance. There is generally a very considerable loss of weight after one of these hemorrhages.

The attacks caused by ulcer grow worse in time, and the periods of relief less marked, so that distress becomes continuous and the pain is not relieved by food, alkalis and vomiting, as in the early years.

**Cause.**—The cause of ulcer is not surely known, but ulcer is frequently associated with chronic appendicitis and sometimes with gall-bladder disease. It may be caused by chronic tonsillitis or Riggs' disease. It has only recently been recognized as a common cause of digestion in men, and cases have heretofore been regarded as "nervous dyspepsia" or "acidity." Chronic ulcer of the stomach and bowel is nearly as common as appendicitis, and has been found in one per cent. of all persons dying from all causes.

**Diagnosis.**—While the relation of pain to the taking of food is the most distinguishing feature in ulcer, no such relationship exists in gall-bladder disease.

The appetite is generally good in ulcer. The dangers of ulcer, when left to run its course, are perforation of the stomach and bowels, followed by immediate peritonitis or inflammation of the bowels, and bleeding from the bowels or vomiting of blood. The latter is rarely fatal. The gradual closing of the outlet of the stomach (pylorus) by contraction of the ulcer is also a symptom. This leads to vomiting of food and consequent starvation.



Ulcer of the stomach not infrequently results in cancer and this is the greatest danger of all. The larger number of cases of cancer of the stomach (60 to 70 per cent.) originate in ulcer, and cancer of the stomach is the most common form of cancer. Ulcer in the first part of the bowel (duodenum) practically never terminates in cancer, however. When pain does not occur until three or four hours after eating the ulcer is more apt to be in the bowel than in the stomach. In ulcer of the stomach the pain is likely to be felt much sooner after meals.

The history of the symptoms from the beginning will often enable a doctor to make a positive diagnosis—it is better than any method of examination. The author knows of a patient who had traveled through Europe from South America to obtain a diagnosis in a case of chronic stomach trouble, finally to have it made by a nurse who was taking notes for a physician at a celebrated clinic (Mayo) in this country. She had been taught that such a history as we have described means a probable case of ulcer. The diagnosis was proved correct at operation. The patient was quite indignant that a nurse should have the impudence to suggest a diagnosis when great authorities had failed.

Physical examination may be of no value or may show tenderness over the site of the ulcer; the finding of blood and a large amount of acid in the stomach contents, and blood in the bowel discharges, favors the diagnosis of ulcer, and the x-ray may actually show its presence.

**Treatment.**—Here again medical opinion is divided between medical and surgical treatment. After a surgeon has had numbers of patients, who have been “cured” three or four times, come to him with an ulcer visible across the room at operation, he naturally becomes skeptical concerning the results of medical treatment. However, since the disease must exist some time before one can make a positive diagnosis of chronic ulcer, and since many patients are permanently cured by medical treatment, this should be pursued in the first few attacks at least. Of course such treatment must be properly directed by a physician. The percentage of cures of chronic ulcer by medical treatment is doubtful since recurrence may arise

years after apparent cure. No case should be considered cured until at least two years have elapsed after apparent recovery.

It is stated by good authorities that 40 per cent. of cases are permanently cured by medical treatment. The medical treatment consists of rest in bed, heat to the abdomen, and—after a few days of starvation—the use of a diet of milk and raw eggs, with alkalis and bismuth to reduce acid in the stomach. During the periods when the patient feels perfectly well the ulcer may be wholly unhealed, as may be shown at operation.

The surgical treatment consists in removal of the ulcer-bearing area, when possible, and usually in making a new outlet in the lowest part of the stomach, and connecting this with an opening in the first part of the small intestine (gastrojejunostomy). The food is then prevented from leaving the stomach by the normal outlet, through closure of this outlet. The operation in the hands of experts is but little more dangerous than that for chronic appendicitis. Experts, like the Mayo brothers, lose but one or two patients in every two hundred operations for ulcer. The results of the operation are very favorable—providing expert surgeons are employed.

At the Mayo clinic in 600 cases of ulcer it was found, two years after operation, that 67 per cent. were completely cured and 96 per cent. were benefited. In some 1,341 cases of ulcer operated upon, the Mayo brothers found a large per cent. had, at the same time, chronic appendicitis and gall-bladder trouble which needed operation for cure. This is another reason for operation, as it may be impossible to diagnose such complications, and they cannot be cured by medical treatment.

#### CANCER OF THE STOMACH

Cancer of the stomach is the most common of all cancers, constituting about one-third of cancers in all parts of the body.

**Treatment.**—Cancer of the stomach is curable in its early stages by surgery, and by no other means; also it is *only* in the early stages that it is curable. For this reason the disease is mentioned in this book—to call the layman's attention to the earliest symptoms suggesting cancer, so that he may at once consult a physician.

**Symptoms.**—Cancer occurs more often between the ages of forty and sixty, more frequently in men. If it affects the body of the stomach and not the inlet or outlet, the symptoms are so slight in many cases as not to be noticeable until the disease has spread to other organs. Cancer of the outlet is the rule and in these cases there is obstruction and vomiting.

Indigestion beginning for the first time in the middle-aged, and accompanied by loss of weight, strength, and appetite, should cause the patient to lose no time in seeking a good diagnostician. In other cases the patient has suffered at various periods for years, from dyspepsia and pain, as described under ulcer, and the condition has become constant, instead of only at certain periods. The pain becomes more continuous, and is not relieved by food; vomiting is more frequent; appetite is lost; and meat and fat are particularly repugnant (this applies to most cases of stomach cancer). Weight and strength begin to fail. It is probable that 70 per cent. of cases of cancer follow ulcer, and that many have a past history of indigestion—sometimes years before, however. In many cases of ulcer there is no pain, so that the disease is not recognized until cancer or other complication occurs.

The pain in cancer is dull and sickening, and usually made worse by eating. The matter vomited is peculiar, as it represents food poorly digested which has been taken hours or days before. The stomach contents often has a foul odor and may be of the color of coffee grounds and may contain blood. The patient usually looks calm and hopeless, and the face is pinched, pale, or of a lemon color. In addition a small lump or tumor may be felt by the patient; it is movable and is felt above and often a little to the right of the navel.

Two signs are sought by the doctor: the presence of tumor over the stomach region, and the presence of obstruction at the outlet of the stomach. The existence of either of these is a probable sign of cancer. If a handful of raisins and partly cooked rice are eaten the night before with the supper, and the stomach emptied before eating in the morning by the stomach tube, in most cases, the presence of the raisins and rice in the stomach contents—especially with



other food—indicates the existence of obstruction to the outlet of the stomach.

X-ray examination is worth all the other means of diagnosis in stomach troubles together. In suspected cancer it may be of the greatest value.

**Outlook.**—To summarize, it may be said that the middle-aged man should seek the earliest medical advice when attacked by constant stomach trouble, and that he who has had stomach trouble in past times, like that described under ulcer, is also apt to have cancer later—this should be kept in mind. In some cases the existence of cancer is doubtful, and patients should not hesitate to allow a skillful surgeon to open the abdomen in order to explore. Delay is fatal.

The Mayos had operated on 627 cases of stomach cancer up to 1910. Some of these were too far gone to remove the cancer. They have reported that 20 per cent. of the cases, in which the cancerous part of the stomach was removed, were alive and well three years after operation.

About nine patients in one hundred die from the operation (Mayo). Without operation cancer of the stomach is invariably fatal, usually in one and one-half to two years.

In a large percentage of the cases operated upon, relief is only obtained by making a new outlet to the stomach to allow of escape of the stomach contents. In these cases the cancer is too far advanced to permit of its removal. Part of the stomach may be removed with immunity but not the larger part. Cancer always begins as a local disease and, so far as is known, only local means will cure it. The whole success of surgical removal of cancer anywhere depends upon its early removal.

#### STOMACH TROUBLE FROM CHRONIC APPENDICITIS

Many cases of chronic appendicitis present no local symptoms of trouble with the appendix—that is, there is no pain or tenderness over the appendix, the latter situated at a point two inches or so below a point three or four inches to the right of the navel and on a horizontal line with it. In other words the appendix is situated



in the abdomen under a point on the belly wall below and to the right of the navel (Fig. 57, N).

Pressure on the belly below and to the right of the navel will give pain in acute appendicitis.

**Symptoms.**—In the stomach trouble caused by chronic appendicitis the pain occurs in attacks or at periods, with slight discomfort, or none, between these attacks. The pain is in the stomach region above the navel, but with a tendency to extend down toward the navel or below.

**Diagnosis.**—The pain is not severe and is not relieved by food, as in ulcer. It is more a distress than a pain, with nausea and a sour, bloated stomach. The pain does not occur with regularity two to four hours after eating as in ulcer, nor is it relieved by food. The attacks are too lasting for gall-stones, and are without the severe pain.

If the patient has ever had severe pain or tenderness over the appendix the diagnosis of chronic appendicitis may be suspected. In other cases examination of the blood and taking the temperature every evening (for slight fever) may throw light on the diagnosis. Sometimes only opening the abdomen will positively prove the cause of such stomach trouble to be a chronically inflamed appendix.

The danger of such operation is slight in the hands of a skillful surgeon—one death in three hundred to four hundred operations.

**Treatment.**—There is no medicine or other medical means capable of curing appendicitis. Surgical removal of the appendix is the only remedy.

#### FUNCTIONAL INDIGESTION

##### *(Faulty Development and Posture—Enteroptosis)*

This is by far the most important of all conditions causing indigestion, in fact, it is the most important problem in all medicine to-day because it is so common and has such unbelievably far-reaching consequences.

In this class are included the weaklings of the human race and the sufferers from a great many other diseases which are secondary to the digestive disturbances. These include a very wide range of diseases, because the weakening effect of constant dis-

ordered digestion makes the subject liable to all sorts of ailments.

The medical term for the kind of faulty development and posture under discussion is enteroptosis. This means a falling down of the abdominal organs from their proper position. There are two forms of enteroptosis, the form with which one of every

five persons is born and that acquired by faulty posture. The faulty posture is always seen in the first type, the reasons for which follow below.

**Symptoms.**—It is easy for anyone to recognize enteroptosis by closely observing persons, even when they are clothed. It is not noticed in persons born with the trouble until they have been in an upright position for some time—in other words, children four or five years of age. There is imperfect development of the child before it is born so that, besides its physique, to be described, the intestines are commonly much shorter than usual, sometimes only one-half the normal length, and are more loosely attached. Other anomalies are also present which make the internal organs sag when the patient is in an erect posture.

Now as to the posture:—In standing, subjects of enteroptosis are stoop-shouldered and “pot-bellied,” even when thin: that is, the shoulder blades project backward, the head is run forward, and



FIG. 58.—ENTEROPTOSIS SHOWING HEAD FORWARD, SHOULDER BLADES AND LOWER PART OF BELLY PROMINENT.

when the subject is seen in profile (especially undressed), the abdomen will protrude most below the navel (Fig. 58). This position is always taken in those born with enteroptosis, because the organs pull down on their attachments to the partition (diaphragm) separating the chest from the belly and also to a cord (cervical fascia) reaching up from the diaphragm to the back of the neck.

The faulty posture is taken by those who acquire it through laziness and ignorance (Figs. 59, 60 and 61); an enormous amount of harm may be caused by such a posture in producing dyspepsia and diverse diseases. If everyone would assume the military erect posture it is probable that more ill health and failure in life could be avoided than by any other possible preventive method now known. The person born with enteroptosis is also almost always very thin and is the sort of person who would be likely to develop consumption. It is a fact that almost all cases of tuberculosis are found in persons born with faulty development, or enteroptosis, which we have been describing.

With the clothes off other marked signs of enteroptosis may be observed: a long narrow chest and long narrow abdomen; then a very important point—the degree of angle formed by the coming together of the margin of the ribs in joining the breast bone in front and at the upper part of the abdomen. This angle in the normal person should be broad, the lower border of the ribs sloping gently downward and backward to the spine (Fig. 63). In the subject of enteroptosis the space is very narrow between the margin of the ribs in front and the latter run down almost vertically. This makes the chest long and narrow so that there is no room for the stomach and other organs where they belong—in the upper part of the belly—and they are crowded down (Fig. 62). Moreover, pressure, as by dress bands or tight corsets, about this region will still further aggravate the trouble.

In profile the naked person will show even more the protrusion of the belly below the navel, whereas in the normal figure there should be a little more protrusion above the navel and flatness below.

Examination of the cuts will give one a better idea than any description possibly can.

The stooping posture, in those born with faulty development



FIG. 59. FAULTY POSTURE, FAVORING ENTEROPTOSIS.

described, is due to the fact that there is not room in the upper part of the belly and the organs situated there are forced downward, pulling with them the diaphragm and a cord (cervical fascia) attaching the diaphragm to the neck. As the organs are also more poorly supported in these subjects of enteroptosis they are more easily forced out of place.

In acquired enteroptosis (Figs. 59, 60 and 61), through a stooping posture assumed in normal persons, the organs are not displaced



FIG. 60.—FAULTY POSTURE, FAVORING ENTEROPTOSIS.

nearly so much, but the symptoms may be greater owing to the fact that the attachments of the organs are firm and kinks and obstructions are more likely to exist.

**Diagnosis.**—Examination of the stomach by the doctor, who blows up the stomach through a tube to discover its size and position, is a common means of diagnosis. More recently the x-ray has been used to take a picture of the

stomach and bowels after the swallowing of some harmless metallic powder by the patient. This is the only exact method. But in determining the diagnosis of most cases the build and posture of the patient will be sufficient to determine the presence or absence of enteroptosis.

**General Results.**—Indigestion is due to a low position of the stomach, so that it does not empty itself properly in the upright position; also there is general lack of tone in these stomachs, and symptoms resulting from stagnation of food.

The imperfect development in the bowels, where there may be but half the normal length of the portion where most digestion and



absorption of food occurs (small intestine), tends toward imperfect nourishment. The large bowels should normally have a fixed and uniform position, but in enteroptosis they sag so much that kinks and pouches form, leading to slow passage of the contents. This usually is shown by constipation, although there may be a daily passage, and yet some of the bowel contents may be delayed for a long time in pouches behind obstructions. The products of digestion, or in this case indigestion, from delay of the intestinal contents, may be absorbed into the blood and prove poisonous—with many diverse symptoms (auto-intoxication).

Various forms of joint and skin disease and old age itself are thus favored. Sagging of the organs on each other causes absorption of the normal padding of fat in the abdomen from pressure, and the organs may press unduly on those great, vital nervous centers controlling the state of the blood vessels, with unfortunate consequences—such as high blood pressure, etc.

Sagging of the right kidney is common with kinking of the duct for the escape of urine. This leads to attacks of great pain. Sagging of the liver is usual, and some cases of gall-bladder disease may be due to the obstructed circulation in this region. Cases of diabetes have been recorded due to sagging of the pancreas. Finally the vitality is so lowered by interference with digestion that the subject, as we said in the beginning, becomes a weakling and is apt to succumb to such chronic diseases, as tuberculosis, and even to acute disorders, as infantile paralysis.

**Outlook.**—Persons born with the enteroptotic physique are not robust and are apt to belong to the so-called “Nervous class” of pa-



FIG. 61.—FAULTY POSTURE, FAVORING ENTEROPTOSIS.

tients and to develop many other diseases, as enumerated above—unless properly cared for. If these imperfectly developed persons are cared for, from early age especially, the probability of their ultimate health is very favorable.

The object of this article is not to describe in detail such treatment as could be readily carried out by the reader; such is impossible and unnecessary, as the condition is not one of emergency, and will require the advice of an able physician. The object has been chiefly to draw attention to a most important defect which can be recognized by any observant and intelligent person, so that medical services may be obtained, especially for children who are very apt to inherit the enteroptotic physique from parents suffering from it. The treatment described will then be general and brief.

**General Treatment.**—The general treatment of persons with enteroptosis consists in making them assume the proper position, which means, standing erect as if trying to be as tall as possible, without standing on tiptoes, holding the head erect, throwing the shoulders back, and holding the lower abdomen in. One should not lounge in chairs, as shown in cut (Fig. 60), or stand with the hands in the pockets, as in cut (Fig. 59). In sitting, the back of the chair should be a flat surface, sloping slightly backward so that the whole back of the person can be evenly supported. A belt which will support and press the intestines and stomach up into place is advisable in most cases in adults (Fig. 64).

In children shoulder and back braces are often required to secure the proper posture. The clothing in children should not be supported by shoulder straps, which cause the shoulders to droop forward; the support should be obtained from straps passing just to the outer side of the root of the neck. It should be understood that not every patient who has been born with, or who has acquired, enteroptosis suffers from it.

The digestive symptoms are due to stretching of the stomach and loss of tone in the organ, or atony. Indigestion usually arises when there is general loss of tone or when the patient is "run down." If the health is generally good and attention is paid to correcting the faulty posture and to generally leading a healthy life, there may

never be any symptoms. This is the reason for training the young born with the faulty development of enteroptosis so that they may never suffer from the condition.

About one in every six patients complaining of indigestion is suffering from enteroptosis, and for every male there are seven female sufferers. While the faulty development may be equally common in both sexes at birth, the relaxation of the abdomen following childbirth and the pressure of corsets and tight waistbands favors the downward displacement of the stomach and bowels—about twenty-five per cent. of women have enteroptosis.

**Digestive Symptoms.**—These are due to the sagging and stretching of the stomach (atony), as noted above, and also to partial obstructions of the bowel by kinking.

The first symptoms often occur after some nervous strain, grief, or overwork, and the indigestion may only trouble the patient at times at first and then become constant.

Gas in the stomach, with a feeling of weight and discomfort an hour or two after eating, are common; nausea and vomiting of bile on occasions are also frequent. Headache, dizziness, loss of weight, insomnia and constipation may be present. In cases of long standing the skin is stained a brownish hue. Most of the patients have many nervous symptoms.

**Treatment of Digestive Symptoms.**—In addition to the constant wearing of a proper abdominal belt by day, the patient should lie down for two hours, if possible, after lunch. The position should be on the back with the shoulders and head somewhat raised, or

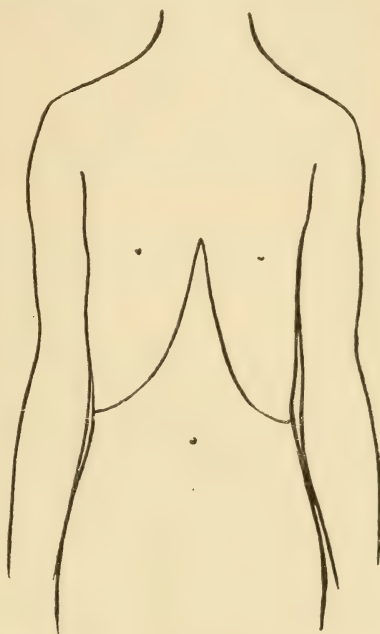


FIG. 62.—ENTEROPTOTIC BUILD—LONG NARROW CHEST AND ABDOMEN; LONG NARROW ANGLE BETWEEN RIB MARGINS.

on the right side to favor emptying the stomach—since the lack of tone prevents the expulsion of food from the stomach in the proper time. The diet should be as recommended under Atony of the Stomach.

In severe cases what is called the rest cure is recommended. In these cases the patient stays in bed for four weeks, having a special nurse who administers massage, electricity, and water or hydro-

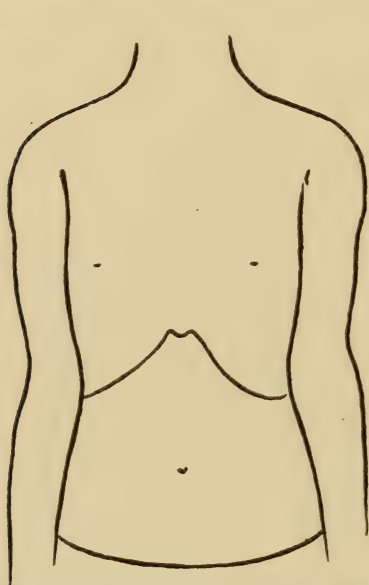


FIG. 63.—NORMAL BROAD CHEST—WIDE ANGLE BETWEEN RIB MARGINS, GIVING WIDE UPPER ABDOMEN.

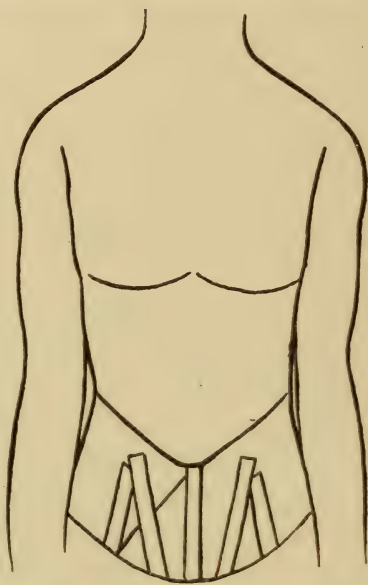


FIG. 64.—BELT FOR ENTEROPTOSIS—STRAPS BETWEEN THIGHS TO HOLD IT DOWN.

pathic treatment, and gives frequent and abundant nourishment with the idea of very considerably increasing the weight of the patient. In all medical treatment of this disease gain in weight is the object chiefly sought. Drug treatment is much the same as for atony.

The subject of indigestion with enteroptosis may have the consolation of knowing that his trouble is probably functional, while the well-built individual who suffers from chronic dyspepsia is more apt to have ulcer, gall-bladder trouble, or chronic appendicitis—in other words organic disease.



**ATONY OF THE STOMACH**

Atony means without tone. By tone is meant the elasticity of the living, normal stomach. Thus when food enters the normal stomach it does not fall to the bottom, as it would in a bag, but the natural resistance of the muscular wall of the stomach causes it to assume a cylindrical shape. As more and more food enters the stomach, instead of filling to the top, it broadens out above, as a certain amount of air always fills the upper part. In the stomach with loss of muscular tone the food does drop to the bottom and distends that part of the stomach, much as would happen if it were poured into a bag.

Atony is one of the most frequent forms of dyspepsia occurring in 17 to 32 per cent. of the cases that present themselves for treatment for indigestion.

**Causes.**—Nervous debility is the most frequent cause and as this goes hand in hand with enteroptosis, atony is present as a rule, in the latter disease. Too much eating and drinking, excessive use of alcohol and tea, and all sorts of debilitating diseases are causes. Heredity is the most frequent cause, that is, atony occurs most often in those born with a tendency to nervous weakness and faulty development, as previously described.

Chronic constipation, the use of cathartics, and diseases of the female organs favor atony.

**Symptoms.**—Gas is the chief complaint, both in the stomach and bowels. This causes a feeling of fullness, heaviness, and discomfort soon after eating. The greater the amount of food and drink the greater the following distress. The kind of food does not influence the result.

The discomfort is worse for one to two hours after eating, and then it generally subsides. In severe cases there may be continuous discomfort, and the patient may be kept awake at night, or awaken early with it.

The site of the discomfort depends upon the site of the stomach. Sometimes gas in the bowels is most prominent, and then discomfort below the stomach comes on two to four hours after eating and may

last during the night. Very rarely is there any actual pain, and if this exists it is probable that the trouble is not atony. In mild cases the discomfort is only felt after a hearty meal; in severe cases distress occurs after every meal or most of the time.

There is usually constipation. Sick headaches are common at various intervals. The pain begins in one eye, spreads to one side of the head, and nausea and vomiting come on; sometimes instead of this there is a dull headache at the back of the head. The trouble is aggravated by overeating or drinking, by starchy foods, and fruit. Palpitation of the heart is frequent, especially after lying down.

**Diagnosis.**—Atony of the stomach does not usually occur in stout healthy looking persons, but in the thin and nervous and those having the signs of enteroptosis. Besides the symptoms already described there is usually a splashing sound heard on lightly tapping over the stomach with the fingers within three hours after eating and when the patient is lying down. If this sound is heard in persons with thin abdominal walls immediately after drinking a glass of water, while fasting, it is a sure sign of atony.

The other means of diagnosis are only open to the doctor who can tell by emptying the stomach five hours after the patient takes a cup of coffee, steak, and roll—because then the stomach should be practically empty. The finding of any amount of food remnants is a sign of atony. Food remaining in the stomach twelve hours after eating is, however, a sign of obstruction to the outlet, and not atony. The x-ray is the most reliable method of diagnosis.

**Course of the Disease.**—Many cases may be cured but, when once the disease becomes chronic, it is apt to recur whenever the patient is subjected to unusual nervous or physical strain.

**Treatment.**—The patient with atony should not exceed his normal limitations, as to work or physical or nervous strain of any kind. The amount of food and drink at one time should be limited but enough food should be taken to sustain the weight and strength. Small meals and often is the rule. One should not drink more than half a glass of any liquid at a time between meals, nor more than a glass at meals.

It is well to take a sandwich or crackers, and a glass of milk

or egg nog, during the morning and afternoon, and at bedtime. At breakfast—cereal, coffee and soft egg, or toast without cereal; for lunch—chop, or steak, or chicken, one vegetable, rice, tapioca, custard or other simple pudding; for dinner—fish, chicken, chop or steak, mutton or roast beef, two green vegetables, and a simple pudding. Macaroni or spaghetti may be used in place of green vegetables. A chicken or scraped beef sandwich may be taken between meals. Buttermilk or malted milk may be used in place of milk to a certain extent.

The use of an abdominal belt in cases of faulty development is advisable, as previously recommended. Lying down for an hour or two after the noon meal may be necessary for a cure. Cathartics only increase stomach atony; the use of a quart of warm soapsuds injected from a fountain syringe into the bowel, with the patient lying down, is the best remedy for constipation.

The employment of a bitter tonic, such as the following, is of advantage:

#### FORMULA FOR BITTER TONIC

Tincture of nux vomica.....	1/2 ounce
Compound tincture of gentian.....	1 1/2 ounces
Compound tincture of cinchona.....	2 ounces

Mix.

Directions: Take one teaspoonful in one-quarter of a glass of water immediately before eating, three times daily.

#### NERVOUS INDIGESTION

Nervous dyspepsia has been thought quite frequent in the past, so that older medical authorities estimated 50 to 75 per cent. of all patients with indigestion to be suffering from this form. Recent authorities find but 3 to 15 per cent. of all patients with indigestion have the nervous form. Even this number may be cut down by improvements in methods of diagnosis. The trouble has been that cases of indigestion have not been carefully studied and the real causes of indigestion have not been discovered. We repeat the fact stated in the beginning of this chapter—that only 10 per cent. of all stomach troubles are actually stomach diseases and that 90 per cent. of stomach disorders are but disturbances of the stomach having



their origin in disease of other parts of the body. When these causative diseases are cured the stomach trouble vanishes spontaneously.

How many unfortunate sufferers have for years led a wretched existence, have consulted numerous doctors, only to receive the verdict of "nervous dyspepsia," but later have found out that ulcer of the stomach or a diseased appendix or gall-bladder was the offending organ. And with operation permanent recovery followed.

A well-known case on record is that of a man who had suffered from so-called nervous indigestion for a long period, suddenly developing an unmistakable attack of acute appendicitis. His appendix was removed, but after recovery from the operation, the old pain again appeared. His surgeons therefore felt confident that the case had been and was one of nervous indigestion. Later, under the care of another physician, he was stricken with an acute attack of gall-stone colic and was again operated upon and the stones removed. Not long after the old pain in the abdomen recurred. At this time his doctors *knew* the trouble was nervous, for all possible causes had at last been removed; but the patient sought the advice of another practitioner who invoked the aid of the x-ray, and finally a stone was found in the right kidney. This being removed the patient became and remained a well man. It is probable that all three diseases existed at the same time and that a skillful operator could have cured all three at one operation.

The blame for so many falsely diagnosticated cases of nervous indigestion must not be laid wholly upon the careless doctor, but failure in diagnosis is due in part to the fact that only recently have the symptoms of ulcer, gall-bladder disease, and chronic appendicitis become generally known by the profession, and furthermore to the fact that only recently has the use of the x-ray in diagnosis of stomach trouble been perfected.

Certain features of dyspepsia point to a nervous origin; thus persons with enteroptosis are the most common sufferers. The fact that the kind of food eaten does not in any way affect the trouble argues for nervous indigestion. Again nervous dyspepsia is worse when the subject is under nervous or physical strain and is apt to



disappear on change of scene and pleasant surroundings and circumstances.

Perhaps the most characteristic symptom of nervous indigestion is the variability of the discomfort. At times the patient is nauseated; then soon this is forgotten and the patient only complains of distention and weight in the stomach. In organic disease the pain is the same and in the same place constantly.

Hasty eating has always been regarded as a cause of indigestion, in that the food was not properly masticated and mixed with saliva.

Pictures of the stomach during digestion, as shown by the x-ray, after a meal containing some metal as bismuth or barium, demonstrate that rapid eating causes dyspepsia in two ways: first, that too rapid dilation of the stomach by food will cause pain, and second, that considerable air is swallowed with the food when the latter is gulped down. The quantity of air or gas in the stomach is shown by a light area in the upper part of the stomach on the photographic plate.

It would be foolish in a work of this kind to consider in detail the symptoms and treatment of nervous indigestion for, as we have seen, the essential matter is diagnosis, and this requires all the training, ability, and experience of the elect in medicine in order to eliminate all other possible causes of indigestion before it is proper to classify the case as nervous dyspepsia. The chief endeavor on the part of a patient with indigestion is to find a competent medical man who, besides taking a careful history and making a thorough examination of the body and stomach contents, will also employ the x-ray for diagnosis. No means at our command are superfluous, considering the difficulties involved in diagnosis of abdominal troubles.

## CHAPTER III

### DISEASES CAUSING SEVERE ABDOMINAL PAIN

Acute appendicitis. Renal colic. Mucous colic. Sudden obstruction of the bowels. Peritonitis.

Consideration of diseases in which there may be severe pain, including gall-stone colic and chronic appendicitis, will be found in the preceding pages. But under the head of severe pain is meant that which is practically unbearable—and only gall-stone colic fills this definition among the digestive diseases already discussed.

### GENERAL TREATMENT OF INTENSE ABDOMINAL PAIN

It is advisable to summon a physician at once; yet one must give relief to the patient, if a physician cannot be soon obtained.

An immediate dispelling of the pain may be afforded by inhalation of ether or chloroform. Ether is the safer. It may be given by dropping it rapidly drop by drop from the bottle on a folded handkerchief placed over the mouth and nose. There is not the slightest danger in giving it this way, and when the patient starts to become unconscious the ether may be withheld. Or a towel may be folded into a cone and a tablespoonful of ether may be poured within the cone, which is then at once inverted over the nose and mouth of the patient, and the dose repeated every three to five minutes until the patient begins to become unconscious.

Chloroform must be used with greater caution, but it may be given in single drops on a folded handkerchief over the patient's face.

The handkerchief is held an inch or so from the patient's mouth, a fresh drop being allowed to fall on the handkerchief as soon as

the previous one has evaporated. The chloroform may be dropped from a medicine dropper or from a bottle having a small gutter-shaped piece cut out of one side of the length of the cork. Fifteen drops of chloroform, if swallowed on a little sugar, will sometimes give relief from pain—but chloroform or ether must not at the same time be inhaled. The application of folded cloths wrung out in very hot water, and if possible sprinkled with turpentine and applied frequently to the abdomen will give much comfort. If a hot water bag but partly filled (to avoid weight) is laid on top of the wet application the latter will not have to be changed so often.

Large hot poultices of flaxseed, Indian meal, bread, or any of the cereals may be employed. Rubbing the abdomen up on the right side across to the left at the upper part, and down on the left side, may aid the escape of gas from the bowels, if the belly is distended and not tender. A tablespoonful of whisky or brandy in hot water may be swallowed if there is faintness, but with vomiting no food or drink should be taken while the pain lasts. Sometimes changing the position lessens the suffering. When the pain is in one of the groins and back, and shoots down into the testicle, or toward the outlet of the vagina in women, great relief may be afforded if the patient lies in a hot bath. Some one should be present during this process, as sometimes the heat, pain, and nausea cause faintness and the patient may have to be helped out of the bath.

There are certain names ignorantly used to cover the real condition in which the true diagnosis is of urgent importance. Among these are ptomain poisoning, neuralgia of the stomach, and intestinal colic, which are frequently used as a cover for acute appendicitis, gallstones, intestinal obstruction, and other conditions demanding instant surgical treatment. Such names should be used with the greatest hesitancy as they are misleading and often lead to unnecessary death.

Violent abdominal pain cannot be set down to simple indigestion, even if the patient appears to wholly recover within a few hours. Such pain is due to organic disease of the abdominal organs, in most cases, and the cause should be sought for. Periodic attacks of pain, with perhaps long intervals of apparent good health, are

characteristic of gall-stones, appendicitis, stone in the kidney, etc.

We shall consider under the head of diseases causing severe abdominal pain, acute appendicitis, renal colic, mucous colic, obstruction of the bowels, and peritonitis, also gall-stones (already discussed on page 506). Colic in babies and pains suffered by women in labor and during menstruation are treated elsewhere.

#### ACUTE APPENDICITIS

**Causation.**—Appendicitis is the most frequent and important of the causes of severe abdominal pain. It is more common between the ages of ten and thirty.

The appendix is a blind sac into which the intestinal contents find their way and stagnate, and injury to the lining coat (mucous membrane) is readily brought about by retained secretions and dried contents. This damage to the mucous membrane in its turn allows germs, which are always swarming in the bowels, to enter the tissues and cause inflammation. Then the organ degenerates and disappears. Such organs are poorly supplied with blood and so can but feebly resist the inroads of germs.

The disease has undoubtedly become more frequent of late years. Heavy lifting is a cause in some cases, and indiscretions in diet favor an attack—probably in both instances in those in whom the appendix is already diseased. Hardened balls of intestinal contents are probably common causes, as they are found in a large majority of cases of appendicitis at operation. There is no particular way in which one can avoid appendicitis and it appears to be prevalent in certain families.

The germs of some acute diseases find their way through the blood to the appendix, at times, and set up an attack—as is seen during typhoid fever, influenza, and tonsillitis. The old theory—that of grape seeds being a cause of appendicitis—has been exploded.

**Symptoms.**—Pain is the first symptom usually. It often begins about the region of the stomach and navel and shifts after a while to the right lower part of the belly or the region of the appendix. The pain begins suddenly in most cases, and is usually continuous and sometimes agonizing.



Nausea and vomiting usually follow the pain but may be absent. The bowels are commonly constipated, but there may be diarrhea, especially in children. The patient will lie with the legs drawn up toward the belly, so as to relax the abdominal muscles. The most important point in distinguishing this disease from others is the fact that there is tenderness over the inflamed appendix.

The point of tenderness is in the lower part of the belly on the right side, usually nearly midway between the navel and the bony prominence of the right hip. The four fingers of the right hand of the attendant should be laid over this spot and then pressed down slowly but deeply with the left hand. This should also be done on the left side of the belly, so as to compare the two sides. Even when the pain is felt in the middle of the belly, it will be found that there is more tenderness on pressure with the hand of the attendant in the right lower part of the belly than at any other point.

The muscle of the abdomen is also very rigid over the appendix as compared with that on the left side.

The pulse and temperature are usually increased—the temperature almost invariably during the first thirty-six hours of an acute attack. The pulse may be 80 to 120 or more, and the temperature from 100° to 102° F., or higher.

The patient with appendicitis may (1) recover entirely and never have another attack, but this is rare; (2) may have the chronic form simulating stomach trouble which has already been described; (3) may apparently recover wholly and yet have another attack at any time—this is the more common outcome; or (4) the attack may begin as described above, and the patient may die within twenty-four hours, or may continue in pain—slight or severe—and after some days a lump may form in the right side of the abdomen, and the latter may soften into an abscess. This may subside in a few weeks or break internally and cause death, or its contents may break into the bowels and be discharged this way, with recovery.

Many other complications, too difficult for the layman to understand, may occur. The appearance in the course of the disease of chills, rapid pulse, general swelling and drumlike condition of the belly with anxious pinched countenance, cold sweats, and cold and

blue hands and feet, are bad signs. The sudden disappearance of the pain may be a very bad symptom owing to gangrene or perforation of the appendix. In this case the pulse becomes rapid and feeble.

**Diagnosis.**—It is not within the power of the layman to make a positive diagnosis. There is no disease in which it is more necessary to summon a surgeon at the earliest possible moment after the occurrence of the symptoms noted. Most cases having pain and tenderness in the region described are appendicitis, especially in persons under thirty, but there are a number of other diseases which occasionally simulate appendicitis.

**Treatment.**—There is no treatment advisable other than surgery. As soon as the diagnosis is positive the operation should be done in all cases in which the patient is not too sick to stand an operation. The most successful treatment consists in surgical removal of the appendix within twelve hours of the beginning of the attack. If this were the rule there would be practically no deaths. The delay caused by medical treatment is the only reason for death from removal of the appendix; not only this but future attacks are absolutely prevented. Either the attending physician, the patient or his family or friends are usually responsible, through delay, for appendicitis resulting fatally, and the public should be so instructed.

Statistics show that the death rate without surgery, when surgical attendance is not obtainable, is one in ten. The vital argument for early operation in acute appendicitis consists in the fact that the most skilled surgeon cannot tell by examining any individual case of appendicitis whether the patient will recover or not, because he cannot tell by any means at his command what the precise condition of the appendix is.

If, however, the patient begins to steadily improve after the first two or three hours of sickness, one may feel confident of his recovery from that special attack. He should then be advised to have an operation after recovery, as another attack is probable and may occur where immediate surgery might be impossible. There is practically no danger from an appendix operation, when the patient is in general good health; but most patients lose courage and choose

to take the risk of another attack rather than be operated when they feel perfectly well.

When surgery is not employed the best treatment is rest in bed and starvation. This secures rest of the bowels, and is the surest mode of allaying the inflammatory condition. No more opium should be used than is essential to relieve pain. It is best if possible never to give opium in the presence of symptoms of appendicitis until the diagnosis has been made, as the drug obscures the symptoms and makes the patient feel as if he were getting well when he may be in a very critical condition.

The patient should not rise from bed to pass urine or have a movement of the bowels, but should use a bedpan.

No food of any kind should be given until four days after all the pain has subsided—if the attack has been severe and lasted over twenty-four hours. No food should be allowed in any attack while there is any pain. The first food should consist of broths, beef extract and strained thin cereals, which should be given for several days while the patient remains in bed. In severe attacks the patient may rinse his mouth with ice water, or hold ice in his mouth; in less severe attacks he may continually drink small sips of hot water.

It is also well to give one-half pint of water containing one-quarter of a teaspoonful of salt, as an injection in the bowels, every four hours. The injection may be made with a fountain syringe, raised but six inches above the patient so that the water may flow slowly.

Twice in twenty-four hours to replace these injections, an injection containing either one beaten raw egg, with a pinch of salt and a teaspoonful of sugar in a cup of warm milk may be given, or as nourishment two tablespoonfuls of juice squeezed from slightly cooked fresh beef, in a cup of warm water, may be given.

No cathartic of any kind is permissible during an attack of appendicitis. After the pain has passed one may inject one-half pint of warm sweet oil into the bowel and this may be followed, in a few hours, by an injection of one quart of warm soapsuds to move the bowels.

A rubber bag containing cracked ice, and applied over the seat



of pain, in the lower right quarter of the abdomen, is generally better than the use of hot poultices or cloths. However, when ice is not obtainable, hot poultices should be used throughout the attack; these sometimes afford more relief than ice. Inability to pass urine is not uncommon, especially if much opium is taken. The application of hot cloths over the lowest part of the belly, and the injection into the bowel of a pint of water, as hot as can be borne comfortably, will usually assist the passage of urine.

### RENAL COLIC

**Causes.**—Renal colic is caused by the presence of a stone in the kidney or in the narrow tube (ureter) which connects this organ with the urinary bladder; or colic occurs during the passage of a stone from the kidney through the ureter into the bladder. It is more common in men than in women or children. The precise cause for the formation of stone is unknown.

Stone is extremely common in China and in some counties in England. In the United States it is moderately frequent and not confined to particular districts. The more common stones are of uric acid—which is a waste matter—resulting especially in those who are heavy meat-eaters, and who do not drink enough water or take sufficient exercise. The products of inflammation (mucus, pus, germs) may form a core on which the mineral matters are deposited to produce a stone.

**Symptoms.**—The attack often begins suddenly. There is a constant dull pain felt in one side on the back just below the ribs, or below the ribs on one side of the abdomen, with agonizing attacks of pain shooting down into the groin, inner part of the thigh and testicle, on the same side. The pain is accompanied by nausea or vomiting, faintness, and sweating. At the same time there is frequency of urination which is often painful; blood sometimes is seen in the urine. Its presence, with that of the pain just described, is a positive sign of renal colic due to stone. The pain may be felt as much on one side of the abdomen as in the back, and may spread all over the abdomen or even into the chest.

The violent pain may last an hour, or for a day or more, with



intermissions. After the severe pain passes, soreness and aching may remain in the affected side below the ribs, front and back. Rarely is no urine passed during the attack. There may be a chill at the onset of the attack, and the temperature may rise to 101° or 102° F.

The stone may escape from the body in the urine or may remain in the kidney, ureter, or bladder. It is well to seek for the stone in the urine, for a week or more after the attack. If it lodges in the bladder there may be some pain in the lower part of the belly and frequent urination. With the continued presence of stone in the bladder these symptoms persist, and the urine becomes cloudy with a white sediment of pus.

In case of stone remaining in the kidney or ureter violent attacks or pain may not occur, such as have been described. It is not uncommon in these cases that pain may be wholly absent, or appear at times in the upper part of the belly, or in the back, without shooting downward. It is then perhaps difficult to distinguish the trouble from gall-stones or appendicitis, if the pain is on the right side.

Following an attack of renal colic, and in doubtful cases of chronic pain in the abdomen, an x-ray picture should always be taken, in order that the presence of stone in the urinary tract may be known.

When there is no pain the appearance of blood or pus in the urine should suggest stone. Persons with stone in the kidney often have attacks of chills and fever and general aching, at intervals of months and years, which are mistaken for grippe or malaria—unless the urine is properly examined.

**Diagnosis.**—The location of violent pain in one side under the ribs and extending into the thigh and testicle, with drawing up and tenderness of the testicle, associated with frequency of urination, makes the recognition of renal colic a simple matter. If blood is present in the urine at the same time the diagnosis is practically certain.

X-ray examination will positively determine the presence or absence of stone, except in extremely fat persons. The passage of instruments into the kidney by an expert, and the careful examina-

tion of the urine for microscopic blood, are of assistance in the diagnosis.

**Treatment.**—Relief from pain may be secured by following the treatment recommended for severe abdominal pain (in this chapter), especially the use of a hot bath for the patient. Hot drinks, as hot water, or hot lemonade, are useful. If the patient will lie with his head to the ground, the stone will, in some cases, change position and relief will be secured.

There may never be a recurrence of an attack of renal colic, or attacks may be frequent. This follows because after one stone escapes, more may remain in the kidney or ureter. Even if a stone is present in the kidney it may cause no trouble for many years or during the patient's life, although this is not the rule.

Since doubt must always exist as to the presence of stone, after an attack of renal colic, the use of the x-ray is always desirable although often refused by the patient after recovery. If stone is present surgical removal is advisable before inflammation of the kidney sets in—which is only a question of time. After inflammation has occurred, with pus in the urine, the operation is of greater gravity.

The operation for stone in the urinary tract is not usually attended with much danger—providing the patient is in good condition and the surgeon is skillful.

The medical treatment consists in the drinking of large amounts of pure water—distilled, Poland, Bedford, or Saratoga—two quarts daily, and in taking three grains of lithium citrate in tablet form dissolved in a glass of water three times daily. No medicine or mineral water will have the slightest effect in dissolving stone already formed in the kidney or urinary passages, but large quantities of water may assist in washing stones out of the urinary tract and relieving the irritation caused by them. With medicine, the effect of much water drinking is to prevent further stone formation.

Outdoor life and exercise are necessary in effecting a cure, as also the absolute avoidance of alcohol in all its forms. Meat should be eaten in moderation, and not more than once daily.

While appendicitis and gall-stones always require surgical treatment, the majority of persons suffering from renal colic pass the

stone and gravel and thus make a perfect and permanent recovery, although several attacks are frequent within the course of years. This more often is the case where the mode of life is not changed.

### MUCOUS COLIC

This is a disease more common to nervous women than to men, and between the ages of twenty and forty-five. Most of the patients worry greatly over the disorder and are emotional, or are sufferers from nervous prostration, hysteria or melancholia. It is probably the result of chronic constipation. The disease often lasts over a period of many years; although there may be long periods of freedom from pain, it is very difficult to cure.

**Symptoms.**—The peculiar feature of the disease is the painful passage of mucus from the bowels. This appears as a jelly-like substance, or as slime, or at other times as white strings or strips, and rarely as a tubular membrane looking like a part of the bowel itself. The pain is caused by the severe contractions of the bowel in its attempt to expel the mucus, which sticks strongly to the sides of the bowel. There are often rumbling noises in the bowels and the mucus is expelled alone or mixed with excrement. The abdomen is not usually distended. The pain commonly subsides after expulsion of the mucus and the patient may feel well for some time.

The pain is often felt on the left side of the abdomen, and there may be a tender point between the navel and lower border of the ribs. However, sometimes the pain is on the right side in the region of the appendix and, without the history of expulsion of mucus in previous attacks, the disease may be taken for acute appendicitis. It is not uncommonly seen associated with chronic appendicitis, however. A nervous form of diarrhea may occasionally be associated with the passing of mucus.

There is much straining during the passage of the mucus and nervous symptoms, as trembling, palpitation of the heart, and dizziness may also be present. Constipation with some fullness of the bowels and poor appetite often persist between the attacks. Errors in diet, worry, and strong mental emotion tend to bring on an attack.

The passing of mucus is not a sure sign of mucous colic. Mucus



may be passed in normal persons without having any significance. It is sometimes a sign of catarrh of the bowel, and in children it may be due to indigestion, and accompanied by some pain. Mucus and also blood are seen in cancer of the bowel. The diarrhea and passing of mucus in the disease called mucous colic is more often seen in the morning and is sometimes called "morning diarrhea."

**Treatment.**—The essential treatment consists in the cure of the habitual constipation and building up the strength and weight. This disease had long been considered incurable until von Noorden succeeded in curing sixty out of seventy-six patients by the following treatment. Such treatment is most successful, however, when carried out in a sanatorium under the control of a physician.

Pain is relieved by introducing a suppository containing one-third grain of extract of belladonna into the bowel and using compresses of hot flannel on the abdomen. Suppositories are only used when pain is considerable, and one may be given two hours before an injection, if these are painful. The injection is given by raising the hips of the patient on a pillow while she is lying on her back. Then a quart of warm water, containing two teaspoonfuls of baking soda, is allowed to flow slowly into the bowel where it should be retained as long as possible. After it has come away one-half pint of warm olive oil is injected into the bowel, and allowed to remain two hours, when another injection of warm water is given. This comprises the treatment for the first day. Thereafter one injection of warm water and soda is given daily until the bowels move naturally with the use of a proper diet. Sometimes it is better to give an injection of one-half pint of olive oil at night to be retained until the bowels are washed out in the morning.

The diet consists of much fat to build up the patient, and coarse food and fruits to move the bowels. Beginning at seven a. m., nourishment should be taken every two hours. During the day the patient should have five glasses of good milk and a pint of cream; most of the cream may be taken mixed with milk. There should be two regular meals—at one and seven p. m.

At lunch the patient should take some kind of fruit having large seeds and thick skins, such as stewed currants, gooseberries, and



cranberries, or fresh grapes; and during the day she should consume about one-half pound each of butter and coarse graham or rye bread. Rest in bed for a week or so is advisable, at the beginning of the treatment. Some discomfort in the bowels will be felt until the patient becomes accustomed to the change of diet. In nervous and hysterical women, this treatment may be aided by giving an occasional pill of asafetida (five grains); this is harmless and will relieve flatulence besides having a soothing effect.

#### SUDDEN OBSTRUCTION OF THE BOWELS

This condition in adults is more commonly caused by compression of the bowel at some point, as when it is squeezed in the opening in the abdominal wall through which it passes to form a "rupture." Any rupture is at some time likely to be thus "strangulated"—and this is one of the chief reasons for operating on them rather than relying upon trusses.

**Causes.**—A band of tissue resulting from a former inflammation, or operation, in the abdominal cavity may lead to obstruction. A frequent cause of obstruction in children is intussusception or a slipping of one portion of the bowel into a neighboring part, as one joint of a telescope slips into another. Twisting of the bowel on itself is still another source of obstruction, and even an almost knotted condition may at times occur. The existence of an accumulation of hardened excrement in the bowels, more often in the aged, may give rise to complete obstruction. Very rarely the presence of foreign bodies, which may have been accidentally swallowed, or gall-stones, may obstruct the bowels.

Obstruction of the bowels is not a common disease.

**Symptoms.**—Pain, vomiting, persistent constipation—these are the three symptoms. The pain is more often about the navel, beginning suddenly. It is at first intermittent, but later continuous. It varies in intensity from moderate to excruciating pain. In vomiting, the contents of the stomach is first expelled; next we see bile or greenish fluid, and last—in three to five days after the onset—a brownish black substance having an unmistakable odor of human excrement. This sequence of symptoms is characteristic of obstruction. Con-

stipation is complete, but in most of the cases of intussusception in children there is an escape of bloody, slimy material from the bowels, with much straining; or blood is seen in returning rectal injections. Fever is often not present.

With the free passage of either gas or excrement one may be sure that the case is not one of complete obstruction. The belly is often much distended with gas, and although not tender to the touch at first, it rapidly becomes so. A lump may be felt in the belly, especially in children.

The effect of obstruction of the bowels on the general condition is marked. There is great prostration, feeble, rapid pulse, cold hands and feet, anxious, sunken features and cold sweats. If the obstruction is not relieved the patient will not live more than three to six days. Absolute constipation, with constant vomiting and tenderness and distention of the belly, often occur in other conditions than obstruction of the bowels, as in appendicitis and peritonitis. In neither is the vomiting of excrement ever seen, and the former two begin with fever and tenderness in the belly.

**Treatment.**—In addition to the use of opium and external heat as advised in the beginning of the chapter, injections of warm water should be given into the bowel with the patient on his back, and hips raised on a pillow. The water should be allowed to flow from a fountain syringe raised three feet above the patient—as much as six quarts at a time for adults, one and one-half pints for infants—and the injections should be given three times daily, the patient being encouraged to retain the water as long as possible. If the obstruction is due to excrement it will be overcome, and sometimes other forms of obstruction as well—this includes almost one-half the cases in children.

The layman should never treat such a condition if he can help it. A surgeon should be secured at the earliest possible moment, as only early operation will save the patient in case he does not at once respond to injections or inflation of the bowels with air. In severe cases time should not be wasted in medical treatment. Cases of obstruction of the bowels are more commonly cured by surgery than by medical means.

**PERITONITIS***(Inflammation of the Bowels)*

Peritonitis is an inflammation of the membrane which covers the inside of the cavity of the belly, and also the stomach, intestines, and other organs within the cavity.

**Causes.**—Very rarely peritonitis starts as such from blows on the belly or exposure to cold, but it almost invariably is secondary to inflammation of one of the organs within the belly, which extends to the covering of these organs, and then to part or the whole of the membrane (peritoneum) lining the belly cavity. Wounds penetrating the wall of the belly, accidental or surgical, not infrequently cause peritonitis.

Excluding these, the disease in the male is more frequently due to acute appendicitis, and in the female to appendicitis and inflammation of the ovaries and fallopian tubes, following infection from childbirth, miscarriage, etc. Typhoid, dysenteric and cancerous ulceration of the bowels, simple ulcer of the stomach and first part of the bowel, and inflammation of the gall-bladder, may lead to perforation of these organs and to the escape of germs into the belly cavity, where they cause acute inflammation of its whole inner surface, or peritonitis.

Peritonitis may be acute or chronic, general or local. The acute general form is described below. The local form is often found in inflammation about the fallopian tubes and womb in women, and does not ordinarily spread to a general peritonitis nor become fatal. So too there may be a local peritonitis in an acute appendicitis which may be arrested by operation. The danger of acute appendicitis if not operated, is chiefly of a general peritonitis.

**Symptoms of Chronic Peritonitis.**—Chronic peritonitis is seen more often as a result of tuberculosis, and is frequently found in persons who have already had tuberculous trouble in the chest. It is of long and uncertain duration and may terminate in recovery. There is pain, vomiting, constipation, often distention, and tenderness in various parts of the abdomen. There is fever on occasions. Some-



times fluid accumulates in the belly cavity, and in these cases operation is very successful. There may be a lump or tumor felt in the abdomen. The patient is often up and about part of the time.

**Symptoms of Acute Peritonitis.**—Peritonitis in most cases begins with intense pain in the abdomen. The site of pain in the beginning depends upon the location of the organ in which the trouble originates—if in the appendix, there is pain in the lower right quarter of the abdomen; if in the sexual organs of women, the pain is low down in the abdomen, in the middle, or to the right or left.

The pain soon becomes general and continuous over the abdomen instead of in paroxysms as in colics. The pain may lessen as the disease progresses, but the abdomen becomes very tender to pressure, distended, and drumlike. The pain is made worse by movements, and the patient lies on his back, with knees drawn up toward the belly to relax the abdominal muscles. Vomiting is constant and produces much pain. At first whatever happens to be present in the stomach is expelled, later a greenish or yellowish fluid, and finally a brownish or blackish fluid is brought up. The bowels may be loose at first but become constipated. The pulse is rapid (110 to 150), and the temperature may be increased to 100° or 103° F.

The appearance of the face is very characteristic. It is expressive of much suffering and anxiety, the eyes are sunken, the features pinched and often bluish in hue, the nose sharper. The breathing is weak and the skin cold.

General acute peritonitis is one of the most fatal diseases, death occurring in from thirty-six hours to ten days.

**Diagnosis.**—The history of any previous disease in the abdomen may aid in the diagnosis, and also throw light on the origin and treatment. The differentiation of this disease from others in the abdominal cavity is not within the power of the layman. It is evident that a patient with symptoms at all suggestive of peritonitis cannot secure the services of a physician too quickly.

**Treatment.**—Surgery offers almost the only hope in acute general peritonitis. This is especially true of peritonitis following perforation of the appendix, or of ulcer of the stomach and bowel and of the intestines in typhoid fever. Murphy, of Chicago, has reversed



the results in peritonitis following appendicitis by curing most cases where formerly most died. This form of surgical treatment has been commonly adopted. When a medical man cannot be obtained the same treatment should be followed as advised in this chapter in the care of Appendicitis.

Opium may be used more frequently and in sufficient amount to keep the patient fairly comfortable. No cathartics should be given. To relieve the distention of the belly, a quart of warm soapsuds may be injected at frequent intervals into the bowel, and a tablespoonful of turpentine may be added to aid the expulsion of gas. Cloths dipped in turpentine and then wrung out in hot water, or cloths dipped in ice water, should be applied to the abdomen at frequent intervals throughout the disease. Sometimes the one, at times the other, gives more relief.

As convalescence may be protracted, if the patient recovers, his strength must be supported. It is permissible to feed him, if vomiting is not too frequent. One-half cupful of milk may be given every two hours, varied by juice squeezed from hot, rare beef, or white of egg stirred in cold water. Cracked ice held in the mouth will tend to prevent vomiting.

## CHAPTER IV

### DIARRHEAL DISEASES—CONSTIPATION

Disease of adults, including acute and chronic diarrhea, acute and chronic dysentery, cholera morbus, Asiatic cholera, and constipation. Diseases of children, including simple diarrhea or acute intestinal indigestion, summer diarrhea of infants, cholera infantum, and constipation.

### DISEASES OF ADULTS

#### ACUTE AND CHRONIC DIARRHEA

**Causes.**—Diarrhea is brought on by the most various causes, among which are the following: stomach disorders preventing complete gastric digestion, especially with deficiency of acid; acute germ diseases, as typhoid fever, cholera, and cholera morbus; errors in diet, as eating of unripe fruit, special articles of food, and taking certain kinds of drinking water; changes in temperature which lower the vitality, as exposure to excessive heat, especially in children.

Chemical poisons are common causes of diarrhea, as those formed in decomposing meat and fish and overripe fruit, and in improperly prepared canned goods; in decomposing animal and vegetable foods, but particularly in milk and its products, as in ice cream, cream puffs, etc. The last is the chief cause of infant mortality, i. e., germ-laden milk which produces the summer diarrhea and cholera infantum of children.

Still other causes are the exposure of the abdomen to cold when it is insufficiently covered; chemical poisons taken accidentally or with intent; diseases of the heart, liver and lungs causing congestion of the bowels; diseases leading to impoverishment of the blood, as in cancer, anemia and Bright's disease; diseases producing ulceration

of the intestines, as dysentery, cancer and occasionally tuberculosis. Certain intestinal parasites, especially in warm climates, are common causes of diarrhea.

Finally there often appears to be a purely nervous origin of diarrhea due to emotion, anxiety, fright, and overstrain in those of a nervous temperament. This is seen not uncommonly in the sudden diarrhea of students before examinations, in surgeons before undertaking serious operations, and in women with mucous colic.

One of the common causes of severe diarrhea with pain and vomiting is said to be ptomain poisoning. A ptomain is a chemical poison which may be generated by putrid meat or vegetables, but the word is used indiscriminately by many doctors in the case of persons suffering from acute abdominal pain, vomiting, and diarrhea when they are really attacked by appendicitis, gall-stones, abdominal obstruction, etc. The term *ptomain poisoning* is employed so carelessly that careful physicians have come to suspect this diagnosis unless a number of persons are affected about the same time with symptoms after eating some suspicious putrid animal or vegetable food. In a large number of cases of acute and chronic diarrhea the cause is wholly unknown.

Without tuberculosis in the chest, a diarrhea is almost never due to tuberculosis, and it often occurs in consumption without any apparent local disease of the bowels, as ulcers. In many cases chronic diarrhea seems to be due to overwork and overstrain.

**Symptoms.**—Diarrhea consists of frequent, soft, watery movements from the bowels, varying from two to three, or twenty or more discharges daily. It is commonly due to catarrh of the mucous membrane lining the bowels, and this and other causes increase the nervous irritability, movements, and secretions of the bowels so that their contents are expelled more rapidly than usual, and therefore in a more liquid state. The color of the passages is commonly light yellow but may be greenish, from excess of bile, or slimy from mucus, or colorless and watery. In case there is actual ulceration of the bowels, blood and pus may be seen in the movements.

Diarrhea is often accompanied by pain, either continuous or occurring with the movements of the bowels, and sometimes by fever

(temperature 101°-102° F.), nausea, loss of appetite, and vomiting. Rarely there are cold sores on the lips, and pain in the muscles and joints occur. There are no positive signs by which the seat of the trouble in the intestines can be localized.

It is often taught that when the discharges are yellowish or greenish-yellow, containing food remnants and a little mucus, and associated with colicky pain, that the seat of the trouble is in the small or upper intestines, and that diarrhea originating in the lower or large intestine (colon) gives rise to grayish, soupy discharges with mucus. We have no certain means of distinguishing the site of the trouble, however, unless there is much straining with the passages, when the inflammation is in the rectum or lowest part of the bowels.

The chronic diarrhea which appears more often in the morning is more apt to be due to nervous causes, as overwork, loss of sleep, worry, etc., to deficiency of acid in the gastric juice, or to mucous colic. Cabot says the cause is unknown in many, or most, cases of diarrhea since there is no anatomical or other cause apparent. He believes these doubtful cases due to nervous disturbance causing alteration in the blood supply of the bowels. Where blood and pus occur of course ulceration exists in the bowels, but in one-half the cases of ulceration there is no diarrhea.

In cases of chronic diarrhea which have lasted several weeks, the stomach contents should be examined for deficiency of acid, etc., the discharges should be examined for blood, pus, and parasites, and the inside of the lower bowel should be examined through an instrument called a proctoscope. The appearance of mucus in the bowel movements does not possess any special significance.

Chronic diarrhea leads to depression of spirits, general weakness, emaciation, and anemia or pallor. However, the fact that diarrhea has been chronic for a long time is no reason why it may not be readily cured, unless there are pus and blood in the discharges, showing ulceration.

**Treatment.**—There are three essential points in the treatment of diarrhea: *rest*, *diet* and the use of *cathartics*.

In no other disease is rest in bed more important or of more value. After months, or even years of treatment, many cases of



chronic diarrhea will recover at once on being put to bed, without any other treatment. It is only in the severe cases of diarrhea that the patient need go to bed, however. In the acute attacks of diarrhea no solid food should be taken. Three tablespoonfuls of castor oil should be given to adults; children, one to two tablespoonfuls.

A tablespoonful of Epsom salts, in as little hot water as will dissolve it, may be taken and followed at once by a whole glass of water, instead of the castor oil; but this is hardly as efficient.

The diet should consist of a glass of boiled milk every two hours, at first, and then of gruel made by boiling flour in milk, alternating with boiled rice and milk toast made with boiled milk. If nausea and vomiting are present, a teaspoonful of cracked ice with a few drops of brandy may be swallowed at frequent intervals. Water is permissible in all cases, but in small quantities at a time.

Pain in the abdomen is treated by applications of hot towels or a mustard poultice of flour (3 parts) with mustard (1 part), mixed in a thick paste with warm water, and spread between one foot square pieces of old cotton cloth; or flannel wrung out in turpentine and afterwards in hot water.

The best drugs to stop the diarrhea are bismuth subcarbonate—one-half teaspoonful every three hours on the tongue, or chalk mixture—one tablespoonful every two hours, as long as the attack lasts. Both these drugs are absolutely harmless.

If the attack lasts several days it may be necessary for the patient to take opium in some form, as paregoric<sup>1</sup> (one teaspoonful), or laudanum<sup>1</sup> (ten drops), given twice daily. A warm flannel bandage, one foot wide, about the belly, will aid recovery. If the bowel discharges are frequent and watery and do not cease under the treatment just advised, tannalbin may be given in ten grain doses on the tongue thrice daily, along with paregoric.

The diet in chronic diarrhea is much the same. Bismuth is also one of the best remedies, as advised. When milk does not agree, the whites of two raw eggs may be stirred into one-half a glass of cold water, and flavored with a little sherry, and this may be given in

<sup>1</sup> Paregoric and laudanum are preparations of opium only to be obtained by a doctor's prescription.

alternation with broths or strained gruels of barley, oatmeal, or rice. Change of climate is often of most service.

In the acute form of diarrhea the daily injection into the rectum of one quart of warm water, containing one teaspoonful of common salt, may be useful; but in chronic diarrhea the use of injections is more particularly valuable with ulceration of the bowel, as shown by slime or blood in the bowel discharges. The patient's hips should be raised in bed by a pillow under the lower part of the back, and a quart or two of warm water should be allowed to flow in slowly from a fountain syringe hung some two feet above the patient; the injection should be retained as long as possible. They may be given once daily.

Thirty grains of silver nitrate dissolved in one quart of water makes one of the best injections, also lead acetate (sugar of lead), boric acid, or sulphate of copper (blue vitriol) in the proportion of one teaspoonful to one quart of water may be used to advantage. If these injections do not relieve the trouble at once it is not wise to continue them.

As has been said, in many cases after taking to bed a chronic diarrhea may at once disappear.

#### ACUTE AND CHRONIC DYSENTERY

This is an inflammation of the lower bowels (chiefly), manifested by colic and frequent painful passages of blood and mucus, with much straining—in the acute cases, and by diarrhea, alternating with constipation—in the chronic forms.

There are two forms depending upon the cause. In one the cause is a microscopic form of animal life, the ameba.

Amebic dysentery is most common in the Southern States and in the tropics, but is also found in temperate states. The other form is due to several varieties of a vegetable germ or bacillus, and is called bacillary dysentery. This latter type is the cause of epidemics of dysentery in the tropics and is the more common cause of the dysentery occurring in late summer and autumn in temperate parts of the United States: it is frequently the cause of severe summer diarrhea of children.

In military camps dysentery has proved more fatal than shot and

shell; it is very severe in the tropics and has been the cause of a large part of the sickness among soldiers in the Philippines, Porto Rico, Cuba, and South Africa. At the present time there is a vaccine which may be used to prevent the bacillary form of dysentery. It is prepared in the same way and given in the same doses as typhoid fever vaccine, and there is also a serum valuable in the treatment of this form of dysentery.

**Cause.**—The germs of either form of dysentery enter the mouth, chiefly in water contaminated by bowel discharge. Milk products are a source of infection when contaminated with polluted water. Attendants handling patients, especially babies, may infect food; flies are carriers of dysentery germs. Persons who have recovered may for some time pass the germs in their bowel discharge.

**Symptoms.**—One cannot discriminate merely by the symptoms between the form of dysentery caused by the ameba and that by the bacillus. Only microscopical examination of the bowel discharges and blood tests can determine the precise cause.

In the more common variety in the United States the disease begins with slight pains in the abdomen and diarrhea, at first free and painless. Within thirty-six hours there are frequent passages of slime and blood, and small masses of excrement—from fifteen to two hundred movements in twenty-four hours. The movements are accompanied by much pain in the abdomen and straining. There is a constant feeling of unsatisfied desire so that the patient is continually running to the closet, or is inclined to stay there for an indefinite time. Fever, usually moderate ( $102^{\circ}$  to  $103^{\circ}$  F.), coated tongue, rarely a chill at the onset, and occasionally nausea and vomiting, are also accompaniments.

After the end of a week the blood usually disappears, and the passages consist of soft, greenish matter, with slime; but these gradually regain a normal appearance, so that in most cases recovery ensues within ten days. In epidemic dysentery or tropical dysentery the course is often severe and not infrequently fatal.

Beginning as described above, the passages consist soon of blood and mucus, or blood alone. The fever is high ( $103^{\circ}$  to  $104^{\circ}$  F.), there is great straining and pain and constant desire to move the



bowels, and cramps in the arms, legs, and muscles often occur. The joints may become swollen and painful.

The pulse becomes weak and rapid, thirst is intense, the tongue is coated, and great weakness and even delirium appear. If improvement takes place these symptoms abate, the fever and frequency of the passages lessen, and the patient will be on the road to recovery in two or three weeks, unless the disease becomes chronic.

The latter form is unfortunately only too common, owing often to unsuitable surroundings, or improper care or food, and may persist indefinitely unless these conditions can be improved.

Liver abscess often follows long after the amebic form of dysentery has apparently recovered. Ipecac treatment will prevent it.

**Treatment.**—The preventive treatment is the same as that described for typhoid fever. Quiet and absolute rest in bed are imperative, even in chronic cases. The patient must then of course use a bedpan and the attendant employ the same care as in typhoid fever.

The diet is most important and, for the first few days, should consist of white of egg and water, broths, whey, rice water, and strained gruels. The addition of milk sugar to drinks improves their nutritive value. After a few days boiled milk may be used, and later, soft eggs, milk toast, and cereals. Juice squeezed from rare beef may be given at first, and strained rice and barley gruels may be added to broths.

At the beginning of the attack two tablespoonfuls of castor oil, or a heaping tablespoonful of Epsom salts should be taken in a glass of hot water. If a physic has not been employed in the beginning, the oil should be taken later, as it is necessary to clear out the intestines notwithstanding the frequency of movements. Hot cloths, overlaid with a hot water bag, or hot light-weight poultices, may be frequently applied to the belly to relieve griping and distress. To also assuage the pain one-half teaspoonful of laudanum<sup>1</sup> may be injected into the rectum in one-half cup of warm starch solution (made by boiling starch in water), and repeated every few hours if necessary. When the solution is not retained, a teaspoonful of paregoric<sup>1</sup>

<sup>1</sup>Laudanum and paregoric are preparations of opium and can only be obtained by a doctor's prescription.



may be given in water by the mouth every two hours to relieve the pain. Bismuth subcarbonate may be taken every two hours in one-half teaspoonful doses on the tongue.

Ipecac is the most valuable remedy in dysentery and should be given in capsules of keratin, or salol coated pills, at night in one dose, three or four hours after eating, and the patient should be put on a milk diet. This treatment is as useful in the chronic form. Beginning with sixty grains at night the dose is cut down to five grains each night, until ten grains are given. This treatment is of most value in the amebic form, but is of service in the other as well. The active principle of ipecac (emetin) gives still more successful results when injected subcutaneously, and especially in amebic dysentery.

In the acute stage the daily injection of a quart of warm solution containing a teaspoonful of salt in a pint of water, is valuable, and later the use of other solutions. It is advisable to give an occasional dose of castor oil or Epsom salts in the chronic forms. When the disease tends to become chronic the patient should be kept in bed, with a warm flannel bandage about the belly, and take only boiled milk and broths, with rice and barley added, white of egg and water, and soft eggs.

The injection of a quart of kerosene every other day has been found wonderfully curative. The patient is placed face downward in bed, resting on his knees and chest while the kerosene is allowed to flow slowly into the bowels through a rectal tube or large catheter attached to a fountain syringe. In addition, from one to three grains of emetin are daily injected under the skin by a doctor. This treatment is especially successful in the amebic form of dysentery.

In the bacillary form, or when the cause is unknown in chronic dysentery, some of the preparations of silver are useful—as the daily injection into the bowel of fifteen grains, and later thirty grains, of silver nitrate dissolved into a pint of water. Three pints of this solution should be injected at one time from a fountain syringe held but two feet above the patient, in the position described above, which allows the fluid to flow far up into the bowels. The fluid should be retained from fifteen to thirty minutes, if possible.

Drugs by the mouth are not of much value. Change from the

diet advised to ordinary food should be very gradual, especially avoiding fruits and coarse vegetables. During epidemics only boiled water should be taken, and bowel discharges should be disinfected as in typhoid fever.

#### CHOLERA MORBUS

**Causes.**—Cholera morbus is an intense inflammation of the inner coat of the bowels (enteritis) due to poisons in decomposing food. These may be already preformed in food or water, or, owing to the food being indigestible, the decomposition may occur within the bowels. All decomposition is due to germs. There does not appear to be any special germ, however, responsible for this disease.

It is caused then by eating indigestible food, such as raw vegetables, salads, unripe or overripe fruit, tainted fish, shellfish, meat, and impure water.

It is a disease of hot weather occurring more often at night and in healthy, young adults. Chilling of the skin after a hot day, over-fatigue, and the drinking of fermentable liquids, as beer, predispose to the disorder.

Owing to its violence it may be called the cholera infantum of adults. It comes nearer to the popular ptomain poisoning than any other recognized disease.

**Symptoms.**—Cholera morbus comes on suddenly. The patient is seized with a feeling of oppression in the stomach, and nausea, followed by violent vomiting, and diarrhea. In severe cases, watery discharges escape in large amounts from both the stomach and bowels, like the rice water diarrhea in true Asiatic cholera. Violent pains in the belly occur, and cramps often attack the calves of the legs and other parts of the body. Thirst is intense from loss of water. The patient is greatly exhausted by pain, the loss of fluid from the blood, and the general poisoning. The face becomes pinched, the eyes sunken, the pulse rapid and weak, the voice feeble, skin cold and clammy, and the lips, hands and feet blue. In other words more or less collapse is present. The belly is generally tender, the patient lying on the side or back with the legs drawn up. Fever occurs, as will be observed by placing a thermometer in the bowel. The disease usually lasts twelve to twenty-four hours, or longer, but

recovery commonly occurs within a few days. Occasionally diarrhea persists for some time. Death is rare, but may occur in the old or weak.

**Diagnosis.**—In severe forms the symptoms cannot be distinguished from true Asiatic cholera. The latter is a very fatal contagious disease which has not been known in England or the United States since 1873, except in a few cases brought by ships to quarantine in the seaports. Only microscopic examination of the bowel discharges enables the physician to diagnose true cholera by the discovery of the cholera germ. Cholera morbus is not in the least contagious.

Attacks of appendicitis sometimes begin with diarrhea, as well as vomiting, abdominal pain and fever. The tenderness is then in the region of the appendix in the lower right side of the belly and is not general, as in cholera morbus. But as the early recognition of appendicitis is of vital importance it follows that a doctor's aid should always be secured.

**Treatment.**—Opium in some form is the essential remedy. As the patient is continually vomiting and purging, it is impossible to obtain a satisfactory result except by injecting one quarter grain of morphin<sup>1</sup> under the skin. But this is precisely what the layman generally cannot do, so that medicine must be given by the layman through the mouth or bowel.

Ten drops of laudanum,<sup>1</sup> or a tablespoonful of paregoric,<sup>1</sup> should be given in a little ice water and, if soon vomited, the dose should be immediately repeated—even a third time, if the second dose is rejected. If the medicine is retained in the stomach it should be repeated every hour until the vomiting, purging, and pain are relieved. If the medicine is not retained, twenty drops of laudanum in one-half a cupful of warm boiled starch and water may be injected into the bowel, and repeated in the same manner. The giving of small doses of brandy, one tablespoonful in cracked ice half hourly, and the application of heat to the belly by poultices, and hot drinks, tend to prevent collapse.

<sup>1</sup> Powerful drugs, such as morphin, paregoric and laudanum, can only be obtained by a doctor's prescription.



**TRUE CHOLERA***(Asiatic Cholera)*

True cholera originated in India and is prevalent in hot countries. In the United States and England it has not prevailed since 1873, although occasional cases have been brought on shipboard, to be stopped in quarantine in seaports of these countries. It has been common in the Philippines and Manila, but is now well under control there. Cholera occurring in warm weather is usually, but not always, checked by frost.

**Causes.**—Intemperance, debility, indigestion, overexertion, weakness, and unhygienic surroundings predispose to the disorder. The only cause of cholera is a special germ, the "comma bacillus," which is found in the bowel discharges, but which rarely enters the blood. It enters the patient in food or drink. Doctors and nurses do not often contract the contagion if they practice cleanliness, as the germ is present in the stomach and bowel discharges, and by keeping the hands free from contact with these, and by thorough washing after contact with the patient, and by disinfecting his clothing, bedding and utensils, the danger of acquiring the disease is slight.

**Symptoms.**—The symptoms appear two to five days after the germs enter the digestive tract. These symptoms are often not so severe at first as in our cholera morbus. Headache, colicky pains, diarrhea, and general depression may be present for a day or two before the severe stage, or the latter may appear suddenly.

The bowel discharges resemble whey or rice water in appearance, have a slightly disagreeable odor, and may amount to as much as five quarts in twenty-four hours, and may number from twenty to thirty. Vomiting is thin and profuse; there are often cramps in the arms and legs, and a sensation of burning and pressure about the center of the belly. The patient becomes rapidly exhausted by the loss of so much fluid from the blood, and the thirst is distressing.

Collapse appears, with ice cold feet, hands, and face, black lips, pinched features, stupor, feeble voice and weak, rapid pulse and breathing. This stage of collapse may last from two to twenty-four



hours, and if recovery ensues the stage of reaction sets in with returning warmth to the skin, stronger pulse, more natural color, and increased amount of urine. Vomiting and diarrhea lessen. There is fever during the attack, as shown by the thermometer in the bowel. Relapses often occur after promise of recovery, which is, however, frequently complete within a week or two.

The death rate varies from thirty to eighty per cent., according to the prevailing severity of the disease. Youth and old age are unfavorable conditions, as also pregnancy, early vomiting and diarrhea, and cold skin.

Sometimes death occurs within two hours from the beginning of the attack without diarrhea; and occasionally, when the patient is apparently on the road to recovery, he becomes delirious with a rapid, weak pulse, and dies in an unconscious state. There are many very mild cases without collapse in cholera epidemics.

**Diagnosis.**—Cholera morbus is the only disease likely to be confounded with cholera. This is a common disease in hot weather in temperate portions of Europe and the United States, while cholera only appears at rare intervals at seaports where it is introduced by vessels from tropical countries. In severe poisoning by arsenic, corrosive sublimate and mushrooms, the symptoms resemble those of true cholera.

The certain diagnosis of cholera depends upon the finding of the comma bacillus in the bowel discharges.

**Prevention.**—The patient must be isolated, and the discharges from the stomach and bowels must be received in vessels containing a five per cent. solution of carbolic acid, or ten per cent. solution of chlorid of lime, or in a mixture of freshly slaked lime (1 part) and water (4 parts).

The patient should be washed about the mouth after vomiting and about the anus after each bowel movement. The bed and body clothes, napkins, towels, and handkerchiefs of the patient should be thrown into the carbolic solution, when soiled, and boiled for fifteen minutes before again being used. Remnants of meals should be thrown into the fire, or into one of the solutions mentioned, and the eating utensils should be boiled for fifteen minutes after use.

It is advisable for the attendant to wear some loose covering which can be slipped off before leaving the sickroom. The attendant should also wear rubber gloves when handling the patient. The gloves should then be boiled for fifteen minutes after being soiled. It is imperative that flies be kept from the sickroom. The bodies of persons dying of cholera should be wrapped in sheets wet with carbolic acid solution, or other antiseptic, until burial.

Healthy persons may avoid cholera during epidemics by drinking only boiled water, milk, and other fluids, and by avoiding impure ice, uncooked fruits or vegetables, and preventing the contamination of food with flies which convey the germs on their bodies.

While cholera excites great anxiety on account of its fatality it is no more contagious than typhoid fever. There is no danger in being near a patient, as we have shown the germs are only in the vomitus and excrement and these must find their way into the mouth of a person in order that he may acquire the disease. The air is not infected by a patient.

A blood serum from animals made immune to cholera has been injected into persons with great success in the way of prevention and also in lowering the death rate one-half. It is now the accepted special treatment in India and the Philippines.

The attainment of general good health in a cholera epidemic is important, and the occurrence of any diarrhea should demand immediate medical treatment.

**Treatment.**—Diarrhea is usually the first symptom. The patient should at once go to bed and remain there, and a dose of three tablespoonfuls of castor oil should be given at once. The diet should consist of boiled milk, white of egg and water and whey, unless vomiting occurs, when all food should be withheld, but water may be given freely. Hot applications should be made to the belly, as poultices and hot cloths sprinkled with turpentine and covered with a hot water bag. A hot bath containing mustard, and hot water bags to the feet and legs are useful.

For vomiting, lumps of pure ice may be held in the mouth and one-half a teaspoonful of brandy, in a tablespoonful of cracked ice, may be given every fifteen minutes to relieve thirst, strengthen the

patient, and stop vomiting; or, better still, tablespoonful doses of iced dry champagne may be used at the same intervals. The injection of morphin <sup>1</sup> (one-quarter grain) under the skin is most valuable in relieving pain and other symptoms. If a physician is not obtainable one may use Squibb's cholera mixture <sup>1</sup> in teaspoonful doses, or paregoric <sup>1</sup> or laudanum,<sup>1</sup> as recommended for cholera morbus.

Opium must never be used sufficiently to cause stupor, nor in the cold stage—when alcoholic stimulants, hot coffee and external heat are the best remedies.

The injection into the bowel of a warm solution of tannic acid (one hundred and fifty grains to the quart), to the amount of two quarts, allowed to flow in slowly from a fountain syringe every three hours, is of great value in stopping the diarrhea. The patient should lie flat on his back, with the hips raised on a pillow. The injection of salt solution into the patient's vein can only be carried out by a doctor, but has proved of life-saving value in supplying water which is lost in vomiting and diarrhea. Muscular cramps are relieved by opium, rubbing, and warm mustard baths.

During recovery the diet must be carefully watched, and should consist of thin gruels and boiled milk for several days. In no disease are the services of a physician more needed. The only object in describing cholera in a book of this kind is that one may be given an intelligent idea of the disease, which may be of use in prevention, and in case of an unfortunate emergency when a physician's aid could not be at once obtained.

### CONSTIPATION

Constipation means the passing of an insufficient amount of excrement or feces. The movements may be infrequent, or small when passed at normal intervals. While the healthy person usually has one movement in twenty-four hours, some persons have naturally two or three movements daily, while others have but one movement in two or three days, and suffer no bad effects.

**Causation.**—Constipation may be due to mechanical causes ob-

<sup>1</sup> These are all preparations of opium and can only be obtained with a doctor's prescription.



structing the bowels, but this condition is comparatively rare. The more common causes are faulty diet and lack of exercise. We eat food which is too concentrated, as meat and eggs; and too much food is prepared and partially digested, as patent cereals and toast. We need a more bulky and coarse diet such as is taken by the peasantry of Europe.

Women suffer more often than men, for various reasons. They eat, drink, and exercise too little; they wear tight clothes about the bowels; they repress the calls of nature from shame or inconvenience in youth; and their abdominal muscles are weakened by pregnancy in later life. Men form irregular habits through travel. One of the chief harmful results of habitual constipation is the resort to improper medicinal purgatives which increases the trouble by causing the bowels to rely upon a strong and unnatural stimulus to move them. Lack of tone in the muscles of the bowels is the common immediate cause in chronic constipation and is a symptom of general debility and nervous exhaustion.

Constipation may be but a symptom of many other diseases, as of the stomach, intestines, female sexual organs, and disorders of the brain, lungs, and liver. It may be mechanical from pressure of tumors and from adhesions and kinks in the bowels. The condition which has been previously described (*enteroptosis*), where the stomach and bowels are dropped down out of place, leads to kinking of the large bowel and is a common cause of constipation, particularly in women. The use of the x-ray in picturing for us the shape and position of the stomach and bowels has been an enormous step in diagnosis, and now no case of chronic constipation, which does not yield readily to treatment, should fail to have the benefit of x-ray examination.

In certain nervous disorders, as nervous prostration associated with diseases of the sexual organs and hysteria in women, and in old persons, there is a condition of contraction of the lower end of the bowel so that the passages are small and sausage-like, or consist of round, hard balls. The contraction in the lower bowel causes dilatation and gas in the upper part of the bowel.

Constipation occurs more commonly in dark than in fair persons.



Worry and anxiety are frequent causes of constipation by enfeebling the nervous mechanism which controls the action of the bowels. In most cases there is merely a sluggishness of the intestines due to lack of tone, particularly of the muscle of the lower bowel (colon) which propels the feces into the outlet, and the general causes we have to remedy are improper diet, insufficient exercise, and irregularity in going to the closet.

**Symptoms.**—In many persons constipation existing for a week will produce no symptoms, whereas in others absence of one daily movement will cause disturbance in health. Headache, dullness, a bad taste in the mouth, a coated tongue, a feeling of fullness or pain in the stomach or about the navel, nausea, and belching of wind, are some of the common symptoms of constipation. Mental depression and dizziness are not infrequent. Attacks of vomiting sometimes occur.

In chronic constipation due to kinks in the bowel the patient becomes much emaciated, has nervous symptoms and insomnia, and the skin assumes a brownish hue. Much of the so-called biliousness is nothing but the effect of constipation. It is perfectly possible to have a daily movement and yet some of the fecal contents be delayed a long time in pouches in the bowels.

Diarrhea is caused by irritation produced by retained feces, which may become channeled, so that some escapes while retention still persists. Alternating constipation, diarrhea, and vomiting in women suggest retention of intestinal contents which may be felt by the physician in examining the abdomen.

Muddy skin, pimples, and anemia form a common condition in girls owing to constipation. Constipation may also occasion pain in the back and a fullness or pressure low down in the abdomen in women during menstruation. Long-continued constipation is productive of piles. It is very probable that many nervous symptoms attributed to constipation, as neuralgia and dizziness, are in reality a cause of constipation and not a result. We have noted that in nervous disorders the nervous stimuli to the bowels may be deficient.

**Treatment.**—*Diet.*—The treatment of constipation by diet is suc-

cessful in the vast majority of cases. The feeding of bulky food is generally necessary, although there are some persons who have constipation from eating too much and taking too little exercise, and these people are well when exercising regularly.

Fish, meats, eggs, cheese, spaghetti, macaroni, milk, and toast are constipating because they leave little residue in the bowels. Soups are not of service because they are filling but not laxative. Six glasses of water should be taken during each twenty-four hours, and one glass of hot or cold water with a pinch of salt should be taken on rising.

Of most importance in overcoming constipation are coarse bread—rye, whole wheat and Graham—fruits—prunes, peaches, pears, apples, grapes, oranges, grape-fruit—and certain vegetables having a laxative action—tomatoes, cucumbers, potatoes, carrots, beets, onions and spinach. Then the coarser vegetables leaving most residue are of value, including corn, cabbage, Brussels sprouts, turnips, beans, squash, oysterplant, eggplant, celery, and peas. Acids are laxative, as found in fruit, pickles, buttermilk, salads with vinegar, cider, and acid wines. Fats are laxative, as bacon, butter, oil in salads, and cream. A suitable combination of the preceding forms the proper diet for constipation. It is easy to make unsuitable combinations which may produce distress and it is possible that an excess of acid may cause heartburn, and the coarser vegetables may induce flatulence. The taking of a little magnesia after meals will relieve heartburn, and it may be best to avoid cabbage, baked beans, turnips, and Brussels sprouts in case the digestion is poor.

We may suggest the following as a diet for constipation:

#### DIET FOR CONSTIPATION

**BREAKFAST.**—Old-fashioned oatmeal or cracked wheat or Graham meal, for cereal; 2 or 3 slices of whole wheat, rye, or coarse Graham bread, with butter; bacon; marmalade, honey, stewed prunes, or apple sauce; coffee and cream.

**BETWEEN MEALS.**—A glass of buttermilk in the middle of the morning.

**LUNCH.**—Fresh fish—sardines or smoked fish in moderate amount; fruit; 2 vegetables; salad; 2 or 3 slices of coarse bread and butter.

**BETWEEN MEALS.**—A glass of buttermilk in the middle of the afternoon.

**DINNER.**—Vegetable soup; a small amount of meat or fish; 2 vegetables; 2 or 3 slices of coarse bread and butter; salad; and fruit with dessert.

**BEFORE RETIRING.**—A glass of buttermilk.

The essential articles are six or more slices of coarse bread and butter, with fruit at each meal; salad and French dressing with two vegetables, including potatoes, at lunch and dinner; and three glasses of buttermilk. In some patients the foregoing diet will cause too much flatulence so that other means, as agar and bran, or liquid albolene, may be tried.

When it is impossible for a person to regulate his diet, as when boarding, he may find that eating six slices of coarse bread daily, with three glasses of buttermilk, may be sufficient, or the writer has found the following a most efficient combination: two or three tablespoonfuls of a mixture of equal parts of bran and agar-agar. This should be moistened with hot water, seasoned with salt, and eaten raw with sugar for breakfast. The diet may be otherwise such as has been ordinarily taken.

If the bran and agar are eaten daily there are usually large, well-formed movements. The bran should be sterilized and kept by grocers in sealed packages (Ralston's). Agar-agar is a product of Japanese seaweed which should be bought in the apothecary in one-half inch lengths. It swells and forms bulk in the bowel, but is not absorbed, while the bran stimulates the intestines. The combination is a harmless remedy which may be taken indefinitely. When the agar is insufficient it may be combined with the use of albolene. One tablespoonful one-half hour before meals three times daily (*See below*). Tea, cocoa and chocolate are constipating and are unsuitable in constipation.

*Drugs and Injections.*—Drugs should be used only when dietetic means fail, or when traveling, or when one is unable to secure a suitable diet. It is unwise for the young to begin the use of cathartics, but often adults take them for years without the slightest harm. The injury is negligible so long as the proper kind of cathartic



—one which will not lead to greater constipation or require increase in the dose—is employed. Thus one may take one or two tablespoonfuls of olive oil after each meal, beginning with a teaspoonful and gradually increasing. Recently liquid albolene (purified liquid vaselin) has been used with good effect. One tablespoonful to one-half a tumblerful may be taken at bedtime without unpleasantness. This is absolutely harmless and acts as a lubricant, since it is not absorbed. A tablespoonful may be taken three or four times daily between meals and at bedtime.

Stewing an ounce of senna leaves, enclosed in a muslin bag, with four dozen prunes, makes an excellent remedy for constipation. A small saucerful may be taken two or three times daily for several weeks. Aromatic fluidextract of cascara sagrada, in doses of one-half teaspoonful—more or less—at bedtime, may often be taken continuously without increasing the dose, and in some cases the habit of regular evacuation will become so established that the drug may be stopped altogether. Small doses of salts, as Glauber's, Epsom, Rochelle and Carlsbad salts, are commonly taken in amounts varying from a pinch to one or two teaspoonfuls in a whole glass of water on arising. It is rare that they can be taken continuously without increasing the dose or causing gas and distress in the bowels. They are not advisable in thin or pale persons. The same remarks apply to the use of such mineral waters as Pluto, Hunyadi János, Apenta, Congress, Carlsbad, Friedrichshall, etc.

Aloes may be taken daily in the form of the compound laxative pill, one each night. One or more teaspoonfuls of sulphur, in milk or molasses, may be taken each night to produce a soft movement in persons troubled with piles. The daily injection of one pint of soap-suds with a fountain syringe, the patient lying on his back, is useful to secure a movement, but has no curative effect. The giving of large amounts of water by enemata, so as to wash out the lower bowel, is not advisable, except occasionally, as they tend to dilate and weaken the bowels in time.

*Habit.*—Every person should have some regular hour each day for moving the bowels, whether there is any desire to do so or not. The muscles have more effect in moving the bowels if one bends over



with the back parallel with the floor. Ordinarily in beginning treatment for chronic constipation the patient need not feel disturbed if the bowels do not move for several days. The bowels will undoubtedly move within three or four days, and it is much better to wait than to rely upon a cathartic, unless symptoms urgently demand one. Violent straining is unwise; after attempting for three to five minutes to move the bowels it is wiser to wait until the same time the next day.

*Physical Exercise.*—Exercise, next to diet, is the most valuable means of overcoming constipation. Walking is hardly sufficient, but swimming, rowing, tennis, baseball, and, for persons at or past middle age, golf may be regarded as most suitable. The rowing machine, parallel bars, jumping horse, and pulleys are the most effective of gymnasium apparatus. Various exercises may be done at home, such as bending the body until the fingertips touch the floor, to the front and sideways, and taking the first position with the hands held above the head. Lying on the back on the floor and raising the stiffened limbs held together in a straight line until they are at a right angle with the body should also be given a trial. This should be repeated for five minutes and then the movement should be reversed by raising the body at right angles with the legs, while the legs are held stiffly on the floor. This is very difficult unless the toes are held down by some object, as a bureau.

Rubbing and kneading the belly with the fists for ten minutes each morning is of value. Rolling a five to seven pound cannon ball, covered with flannel, over the abdomen for five minutes each morning may bring about a cure. Electricity is of little value.

## DISEASES OF INFANTS AND CHILDREN

### DIARRHEAL DISEASES—SIMPLE DIARRHEA OR ACUTE INTESTINAL INDIGESTION

Both the milder and the more severe form differ from summer diarrhea, or ileocolitis, in that there is an indigestion but *not* an actual inflammation of the intestines, from which recovery must be slow.

Some diarrhea is commonly caused by overfeeding or improper feeding, or by any trouble weakening digestion, as teething. It may

occur in children of all ages. It is of much importance, for the reason that the more serious forms of diarrhea often begin with the simple variety, and after the child is weakened, germs of the more dangerous forms may find a foothold. Therefore, it is exceedingly unwise to neglect diarrhea in an infant, particularly in hot weather. The improper food causing the intestinal indigestion irritates the bowels and thus provokes rapid expulsion of their contents. Other causes, noted under the consideration of diarrhea in adults, may sometimes lead to an attack of diarrhea in children.

**Symptoms.**—The trouble begins with restlessness, and sometimes crying and fretting, owing to pain due to gases in the bowels. The discharges become frequent and loose, but without slime or blood, nor do they have the appearance of water, seen in cholera infantum. The passages may be greenish, but this is not of serious import and may only mean escape of bile. Fever is moderate or slight, although thirst may be excessive from loss of water in the numerous bowel movements.

Or the indigestion may be much more acute and come on suddenly with high fever ( $104^{\circ}$ - $105^{\circ}$  F.), vomiting, and colic, and the bowel movements frequent, with curds and undigested food in them. The discharges grow thinner and greenish in color, and may contain mucus but not blood. Recovery from this severe form may occur within a few days or it may turn into a genuine inflammation of the inner coat described under Summer Diarrhea.

**Treatment.**—Nothing but cool, boiled water should be allowed for twenty-four hours; liquid and solid food of all kinds is to be absolutely withheld. A teaspoonful of castor oil should be given as soon as possible to infants, and repeated if the trouble does not improve rapidly. When the oil is vomited at once tablets each containing one-quarter of a grain of calomel should be given, and one of these every two hours until eight have been taken.

If there is much pain, ten drops of paregoric<sup>1</sup> on a little sugar may be given to an infant. The best remedy to employ, as long as the diarrhea lasts, is a saltspoonful of bismuth subcarbonate mixed with a little sweetened water and dropped on the tongue every three

<sup>1</sup> Paregoric (opium) can be bought only with a doctor's prescription.

hours during the day. The food should be the same as that recommended under Summer Diarrhea.

### SUMMER DIARRHEA OF INFANTS

#### *(Ileocolitis)*

In this form of diarrhea there is actual inflammation of the mucous membrane covering the inside of the bowels, so that it is a much more serious and persistent disease than simple disturbance of intestinal digestion with diarrhea, described above. The name, ileocolitis, means an inflammation of the lower part of the small intestines (ileum), and of the large intestines (colon) which terminate at the anus, or outlet of the bowels.

This diarrhea is due to an infection with germs which are probably chiefly introduced in milk which has become contaminated in the barn with manure and dirt, or by impure water, flies, and human fingers during its many handlings. This disease is probably the most common, and is the cause of more deaths than all the other diseases of infancy combined. It occurs during hot weather, and almost exclusively in babies who are artificially fed, as only three per cent. of cases are found in the breast fed (Holt).

The same group of germs or dysentery bacilli found in adult dysentery are also present in summer diarrhea. They are not always introduced through feeding of dirty milk, as they are sometimes found in diarrhea in breast-fed babies and may be conveyed by drinking water. But two forms of bacteria, or germs, are present in the bowels of healthy, milk-fed infants, a germ causing souring of milk in the upper bowels, and that always found in the lower bowels of both babies and infants (colon bacillus). Under certain circumstances, as in hot weather, these germs—together with the dysentery germs and some others—unite to produce diarrhea in children.

**Prevention.**—Prevention must be the important consideration in this disease. The proper pasteurization of milk, whether it be certified or not, will largely prevent this disease. Pasteurization is advisable all the year round, but milk used for feeding children from June to October should certainly be pasteurized. The water used by



babies for drinking purposes should always be boiled during these same months. These are the essential features in prevention of summer diarrhea, and at the same time, of infant mortality. The death rate of infants has been cut in two by improvement in the milk supply, as by Dr. Goler, in Rochester, New York.

The avoidance of heat by change of residence; light clothing, as a flannel binder and thin dress; fresh air, as obtained by keeping the baby outdoors day and night; and cleanliness and boiling of the nipples, bottles, and milk utensils daily, are also necessary means of prevention. Of course the breast feeding of babies is the most important, but the principal danger is during the first summer following weaning. By using boiled or properly pasteurized milk the disease can practically always be prevented.

**Symptoms.**—Mild cases may develop slowly, as simple diarrhea from intestinal indigestion (already described), with an increasing number of bowel discharges, of a brownish, yellowish, grayish, or greenish color, containing curds of milk or other undigested food. In other cases the diarrhea may begin suddenly with loss of appetite, fever, thirst, crying, colic, and vomiting. The baby may either be listless, restless, or sleepy, or convulsions may occur. The bowels are often distended by gas, with frothy discharges, having an unusually offensive odor. The poisons, produced by germs growing in the contents of the bowels, lead to inflammation of the lining mucous membrane, with the formation of mucus (as in cold in the head), pus, and in severe cases to destruction of the tissues and blood vessels of the intestines (ulceration), so that the discharges contain blood, as well as mucus and pus. The number of discharges varies greatly, from two or three to twenty-four daily. The skin is apt to become raw about the exit of the bowel (anus) from the irritation of the frequent discharges.

Loss of weight is soon apparent, first by softness and flabbiness of the flesh, and then by emaciation. When much mucus and pus occur in the discharges, several weeks of careful treatment are necessary before recovery ensues. The disease may become chronic with passing of fever and pain, and persistence of loose passages and mucus, with loss of weight. Nervous symptoms are common, as stiffness and con-



tractions of the arms and legs. The disease may drag along for months, and recovery or death may ensue.

When great straining and pain attend the bowel movements, which are sometimes almost continuous, the inflammation attacks chiefly the lower bowel. This is a true dysentery. The passages are bloody and slimy and small in amount, and the constant straining leads to protrusion of the bowel.

If the discharges become less frequent, the slime and blood diminish, and the expression assumes a brighter appearance, the chances of recovery within a week are good; but if the face is pale and anxious, the vomiting continues, the bowel movements remain frequent and the belly is swollen, painful, and tender, and restlessness, moaning, and convulsions are present, with little or no urine passed, the outlook is indeed bad.

**Treatment.**—For treatment of this condition see under Cholera Infantum.

### CHOLERA INFANTUM

#### *(Acute Milk Infection)*

This very fatal, but comparatively rare form of diarrhea, is seen almost exclusively in bottle-fed infants. It is a rapid, violent form of poisoning by germs usually derived from impure cows' milk.

**Symptoms.**—Cholera infantum comes on suddenly in hot weather, with constant vomiting and diarrhea. The face becomes very pale, the eyes sunken, and the features pinched and expressive of alarm and suffering. The skin is often cold and clammy, but if the thermometer is placed in the bowel, it shows a very high temperature ( $102^{\circ}$  to  $107^{\circ}$  F.). The pulse is rapid and weak, the breathing shallow and hurried. The passages, at first of a somewhat normal color and containing curds, become rapidly looser and paler, and finally only copious watery discharges escape from the bowels. Fluid is thus drained away from the blood, for there are often as many as thirty discharges in the twenty-four hours. Vomiting is constant and aggravated by food or drink.

The baby wastes away from fretfulness and restlessness, becoming dull, stupid, and finally unconscious with the head thrown back, eyes

half open, lips apart, and fingers clutched; there may be convulsions. The child may remain in this condition for two or three days. The diarrhea and vomiting may stop, but the child may die in unconsciousness. The course may be very rapid, and death may occur within a few hours. A marked improvement or fatal outcome may be expected within two or three days.

Cholera infantum may be distinguished from other forms of infantile diarrhea by the suddenness and violence of the attack, with constant vomiting, large watery bowel discharges, great weakness and collapse, and high fever. The outlook is bad.

**Treatment of Summer Diarrhea and Cholera Infantum.**—The treatment of these disorders must be prompt and heroic. No preconceived ideas or foolish sentiment for the suffering baby, on the parent's part, should be permitted to intervene, or a fatal result may follow. Interference from well-meaning but misguided relatives, neighbors, and friends, thought to be wise in the management of children, is particularly common, and as frequently defeats in the most complete manner all the doctor's efforts. Especially do these kindly but officious persons think the treatment too harsh and urge special or patent foods.

The essence of treatment consists in ridding the stomach and bowels of the offending poison and then in giving these organs absolute rest for a time by total abstinence from all food. One or two teaspoonfuls of castor oil or one-quarter grain tablets of calomel, given hourly until one or two grains are taken, should be the rule as the first form of treatment. The oil is the better unless vomiting prevents its retention. The immediate summoning of a doctor is most important, in severe cases of vomiting and diarrhea in infants, so that he may at once wash out the stomach and bowels, as this is by far the most rapid and effective way by which to get rid of the poison.

When a doctor is not obtainable the baby's stomach may be cleansed by giving it tepid boiled water to drink to encourage vomiting, and washing out of the stomach. If the water is refused the child's nose may be held until the mouth is opened for air, when the water may be poured down. It is not cruel to enforce such treat-

ment. The use of bowel injections is also of the greatest service. If the temperature is high (over 103° F.) cold salt water injections should be given several times a day: the injection of saline solution is always advisable. The proportion of common salt is one level teaspoonful to a pint of water. The baby should lie on his back, a little to the left side, with the hips raised on a pillow. Two or three quarts should be given from a fountain syringe raised two or three feet above the patient. In case the fever is not high the injection may be given warm. A pint should be allowed to flow in from a soft rubber tube (catheter) or, in its absence, from a hard rubber tip.

After the pint has been expelled more should be injected until the two or three quarts are given. This should be repeated at least twice daily if it appears beneficial. The water washes out the poisons in the bowels and some is absorbed and takes the place of that lost by diarrhea.

All water given the baby by mouth or bowel during the entire sickness should be boiled. Later in the disease, with slime and blood in the movements showing ulceration in the bowel, alum may be used to the amount of one teaspoonful to a quart of water, or silver nitrate—fifteen grains to a quart.

The medicinal treatment consists in giving a saltspoonful of bismuth subcarbonate mixed with water, four times daily. This should not be begun, however, until the bowels have been well cleared out and the fever is reduced. Sponging the baby from head to foot several times daily with slightly cool water is useful in fever. The baby should remain outdoors day and night, if possible, in hot weather. Removal to seashore or mountain often does much good. The bismuth should be continued as long as the diarrhea lasts, although it colors the passages black. Twenty drops of whisky or brandy in a teaspoonful of water may be given hourly when there is weakness.

If there is much pain it may be relieved by giving ten drops of paregoric<sup>1</sup> to a one year old baby, repeating it once in three hours if necessary. With high fever and bad smelling passages this should not be used, as paregoric is a form of opium and causes constipation. The feeding is of the utmost importance.

<sup>1</sup> Paregoric (opium) can be bought only with a doctor's prescription.



After twenty-four or forty-eight hours of starving (giving only boiled water) either broths, beef juice, egg water, or barley water may be used. Milk is wholly unfit as a food in these cases and should not be resumed until diarrhea is passed, or late in convalescence. When the discharges are very bad smelling, barley water is the best food; when the passages are frothy and acid (as shown by turning blue litmus paper red), broths, egg water and beef juice are preferable. Otherwise the baby should be given the food among these articles for which he has a preference.

*Egg Water.*—Egg water is made by stirring the whites of three eggs into a pint of cold boiled water and flavoring with salt.

*Meat Broths.*—Broths of beef, mutton, veal, or chicken are made by placing two pounds of cut meat (free from fat), with a cupful of cold water, in a glass jar on the ice for three hours and then slowly cooking it for three more hours, when it is allowed to cool, the fat skimmed off, and salt added. The juice squeezed from a rare piece of round of beef may be given occasionally in teaspoonful doses in the broth.

*Barley Water.*—To make barley water, place two teaspoonfuls of patent barley in a pint of cold water; boil down to two-thirds of a pint, and strain.

A few ounces of one of these—that is, egg water, or broth, or barley water—should be warmed and given in a bottle or spoon every two hours.

This dietary must be continued until the acute diarrhea ceases, when pasteurized milk may be used, beginning with only one or two feedings daily and using skim milk diluted with an equal part of water; sometimes it may be best to partially digest the milk by using peptogenic milk powder. Whey or buttermilk and some of the patent foods, as Malted Milk or Mellin's Food, may also be serviceable during recovery from the disease.

In children over three years of age the disease is generally curable by the use of a dose of castor oil (one to four teaspoonfuls), and, after the bowels have moved, by a diet of broth, boiled milk, and toast. If the diarrhea becomes chronic it may be necessary to feed milk properly diluted or digested, as recommended in this volume for



infants with delicate digestion. Of course such cases should be under the care of a physician, as they need the most careful watching for a long time.

Unless suffering from that most violent form of milk poisoning, cholera infantum, a baby will usually recover from summer diarrhea if the treatment herein outlined is conscientiously and persistently followed and hysterical excitement and advice from would-be helpers be avoided.

Infants show wonderful powers of recuperation, although a sick baby produces a greater upheaval in the family than illness of all the other members of the family put together.

### CONSTIPATION IN INFANTS AND CHILDREN

Constipation is a very common disorder in infants and more often in those artificially fed. Water should be given infants two or three times daily in addition to that contained in their milk. The infant's bowels should move twice daily and the passages should be of a bright yellow color and of a soft pasty consistence, without lumps or curds.

**Treatment.**—Constipation in bottle-fed babies is the rule and must be endured. The golden-yellow passages of the normal breast-fed baby are not to be expected in the bottle-fed baby. The best we can hope for usually is a brownish-yellow passage, and it is often whitish or clay-colored. Sometimes with a change of diet in bottle-fed babies, as the addition of cereal, constipation will disappear and the movements become much more normal. When a baby is overfed there may be constipation with dry, pale feces.

One of the best remedies to combat constipation in babies is Phillip's milk of magnesia, one teaspoonful in a nursing bottle daily. A teaspoonful of orange juice or the juice of stewed prunes, given three times daily between feedings, may aid in securing a normal movement. A teaspoonful of olive oil or paraffin oil night and morning may act as a harmless laxative. Cream is often advised but more frequently increases constipation.

When milk is too rich the passages often are quite white and look as if they contained curds; but this appearance is due to a kind of

soap formed from the excess of fat in the bowels which is not digested and absorbed. Constipation may be relieved by the injection into the bowel each night of one-half cupful of water from a soft rubber bulb syringe with a soft rubber tip. A fresh bulbful should be injected as soon as the previous one has escaped, until a good movement occurs. When magnesia added to the milk is not effective, one may use an enema. Constipation may also be relieved by the daily introduction into the bowel, after wetting, of a small, conical piece of Castile soap—about as thick as a leadpencil and three-quarters of an inch long; or the gluten suppositories, sold by druggists for babies, may be used.

As soon as a baby is two months old a regular time for the bowel movements should be arranged. The baby should be placed upon a small vessel at a regular time after its morning and evening meal. Its back may rest against the nurse who will also support its body in front. It may be necessary to start the habit by the use of a soap suppository, but after a little while this must be dispensed with. Within a few weeks the baby will have a movement soon after he is placed on the vessel. One should indeed be glad to find constipation in a bottle-fed baby in place of possible diarrhea. The constipation will gradually disappear with the beginning of a general diet.

Older children should be treated for constipation, as are adults, by regulating the diet, as recommended, and giving stewed prunes, apple sauce, or baked apple at each meal.

## CHAPTER V

### DISORDERS OF NUTRITION

Diabetes. Obesity. Beriberi. Scurvy. Pellagra. Gout and Goutiness.

#### DIABETES

Diabetes consists of a group of symptoms, including thirst, the passage of a large amount of urine, and loss of weight, caused by disturbance in the assimilative processes of starches and sugar, and due to the presence of large amounts of sugar in the blood.

Diabetes is not at all a disease of the kidneys, as seems to be the popular impression. In health starchy food and sugar are converted, in the upper part of the intestines, by the action of the digestive ferments, into grape sugar, and this is carried into the liver as such, because all the blood streams through this organ from the bowels.

The liver is the great factory and warehouse of sugar. Factory, because it transforms grape sugar (glucose) into a new substance, called glycogen; and warehouse, since sugar is capable of being stored in this form in the liver. The same process goes on to a less extent in the muscles—i. e., some of the sugar is stored there as glycogen.

The maximum storage of sugar in the human body amounts to about ten ounces. Glycogen, in its combustion in the liver and muscles, is the fuel which supplies heat and energy to the body and is therefore a large source of muscular work. Starches, as represented by bread, potatoes, and cereals, together with sugar, normally supply about half the bodily requirements for food and energy. In the absence of such food, meats, fish, and fats, and the same nutrients among vegetables, may replace the starches and sugars, as they do in the treatment of diabetes.

In normal individuals there is but the most minute amount of sugar circulating in the blood—from 1 to 1.5 grains to the quart. In diabetes there may be one hundred times this quantity. The grape sugar coming to the liver in diabetes, instead of being stored there as glycogen, sweeps through the organ and passes into the blood (as grape sugar) and is not assimilated as such by the body, but abstracts from the system a large amount of water, for the solution of the sugar, and escapes unchanged in the urine. In this way thirst and great increase in urine may be explained. Also the body often wastes away, from loss of assimilation of the starches and sugar, and the appetite is frequently enormous in nature's attempt at compensation.

But the function of the liver, in converting sugar into glycogen and storing it as such, is subject to the influence of many outside organs. In fact there is an interlocking group of organs controlled by the nervous (sympathetic) system, with headquarters in the brain (floor of the fourth ventricle), which has complete mastery over the sugar output of the liver. One set of influences increases the action of the liver in its power to store sugar as glycogen and keep it from escaping into the blood.

The other set of influences produces the contrary effect, and prevents the liver from storing glycogen, but allows of free passage of sugar into the blood and urine, and favors diabetes. The effect of the nervous system is seen in the influence of worry, shock, strain, and excitement in favoring diabetes. The influences of the other organs are due to internal secretions which pass into the blood and act on the liver directly, or on other organs affecting the liver—to increase or prevent the storing of sugar in the liver. Thus certain small glands adjoining the kidneys (adrenals), through which the nervous path controlling sugar storage passes (left adrenal) to the liver, secrete a substance which tends to prevent the storing of sugar in the liver. An excess of secretion of these glands will cause diabetes.

Then another large gland, the pancreas (situated behind the stomach), through its internal secretion, acts to increase the liver's power to store sugar and to prevent diabetes. But there are three



other glands whose secretions act in their turn on the pancreas. Two of them, the thyroid (in the neck) and the pituitary (at the base of the brain), tend to set aside the action of the pancreas and so, if their secretions are morbidly excessive, the result may be diabetes. The secretion of the third gland (parathyroids—under the thyroid gland) strengthens the action of the pancreas in causing the liver to store sugar as glycogen.

The chief cause of diabetes is disease and loss of function of the pancreas.

In order to properly treat diabetes it is important to be able to determine in which part of the mechanism the trouble is situated and then be able to remedy the fault at its origin. Our knowledge is not sufficient for this at present. By eliminating starches and sugars from the diet, and allowing proteids and fats to take their place, we may largely remove the sugar-forming function altogether. Some sugar may, however, be formed from fat and proteids and, in severe cases of diabetes, the liver may not be able to even keep this sugar out of the blood and urine.

**Causes.**—The assimilation of an excessive amount of starch and sugar in a normal person may lead to a temporary excretion of sugar in the urine—through failure of the liver to store it—but it is a curious fact that disease of the liver itself does not cause diabetes. Heredity is important in diabetes, often being found in several members of the family and in their descendants. Diabetes is closely allied to obesity and gout in that it is more frequent in subjects of these disorders or their offspring. The disease is more common in adults and in men. It is very fatal in children where the disease is more often hereditary. The well-to-do and Hebrews are the chief sufferers—the two classes are indeed often synonymous.

**Symptoms.**—Excessive thirst and the frequent passage of large amounts of urine are the most salient symptoms. Both the thirst and the large quantity of urine secreted are directly due to the excessive amount of sugar in the blood which requires so much water for its solution.

The urine is pale and has a sweet taste and odor, and from two to seventeen quarts may be passed in the twenty-four hours. The

amount which should be passed in health is three pints in this time. The greater quantity is passed during the day in diabetes, which differs from the case of Bright's disease, in which there is an increased secretion of urine chiefly during the night. In many cases of diabetes the symptoms are so slight that discovery of the disease can only be made by a routine examination of the urine of all patients for sugar. This is the rule among all careful physicians and is one of the requirements for formal examinations of persons for life insurance, etc.

Itching of the skin, together with loss of weight, notwithstanding an enormous appetite in many cases, are also suggestive of diabetes.

Pain in the small of the back, dry skin, boils, eczema, gangrene, cataract, and increasing near-sightedness in adults, are among the frequent complications of diabetes. The treatment comprises the use of proteid (meats, fish, eggs, etc.) and fats in place of the sugars and starches.

While the proteids are burned up thoroughly it often happens that the fats undergo incomplete combustion, and the resulting fatty acids poison the patient. This is the common cause of death in diabetes and occurs in unconsciousness or coma. Coma may begin in various ways, as great difficulty in breathing, or with a condition resembling alcoholic intoxication with headache, abdominal pain, pain in the limbs, drowsiness, or again with a faint feeling after exertion. When a person is found in a state of unconsciousness, with dilated pupils, a fruity or winelike odor in the breath and with long-drawn, strong inspirations, and short, slightly sighing expirations, diabetes should always be suggested.

Coma may appear suddenly in diabetics owing to injury, shock, surgical operation, an attack of indigestion or alcoholic excess.

**Course and Outlook.**—In children the course is apt to be rapid and fatal, especially in those with a diabetic inheritance. In persons over fifty, particularly if stout and active, and given to worry, overwork, and excesses in eating and drinking, the outlook is very good if the patient leads a normal life and restricts himself to a proper diet. In such persons the life may not be shortened by diabetes.

In thin individuals the disease is apt to be more severe. If the

sugar disappears from the urine, on removing all starches and sugars from the diet, and the patient can stand a certain amount of starch—as a baked potato or a slice or two of bread daily—without leading to escape of sugar in the urine, the case is again very favorable. The unpleasant symptoms usually subside with the disappearance of sugar from the urine.

**Prevention.**—Prevention applies especially to the children of diabetic parents; these should be brought up on a diet from which candy, cake, and sweets generally are largely excluded. Testing the urine at least four times a year in the children of diabetics, also in patients and their children, and in those who have previously had sugar in the urine, is of the utmost importance. Since diabetes and obesity are apt to be associated, the stout and their children should reduce their weight by appropriate diet and exercise.

**Treatment.**—The treatment is chiefly dietetic by excluding starches and sugars from the food. The physician usually begins by starving the patient for one to three days, until all sugar has disappeared from the urine, and then he gradually allows the patient to take starch in the form of bread (55 per cent.) or potatoes (16 to 24 per cent.) until sugar again appears in the urine. This shows the tolerance of the patient. Then the patient may be permitted to take daily about one-half of that amount of starch which will lead to the presence of sugar in the urine. Sugar should be wholly withheld. If a patient is losing weight by excluding starchy food he must be allowed a little, even though he gains in weight and some sugar is lost in the urine.

The following diet is one in which starch and sugar are excluded and which may be taken by any person with diabetes as a test:—

#### TEST DIET FOR DIABETES

**BREAKFAST.**—Coffee, large cup with two tablespoonfuls of cream, no sugar; 4 ounces of beefsteak, chop, or ham; and 1 or 2 eggs.

**LUNCH.**—Clear soup with one egg; steak or beef, 3 ounces; 1 slice of bacon. Salad with lettuce or celery, tomatoes or cucumbers and oil, vinegar, salt and pepper to taste. Dessert made from 1 egg and 2 tablespoonfuls of cream. Coffee without sugar or cream.



AFTERNOON TEA.—1 cup of tea with 1 tablespoonful of cream, no sugar.

DINNER.—Clear bouillon or other clear soups, 6 ounces; fish with butter, 4 ounces; beef or mutton, 4 ounces—or without fish, 8 ounces; butter  $2\frac{1}{2}$  drachms; lettuce salad with ten drachms of vinegar and 5 drachms of oil; green vegetable, as below; cheese, 5 drachms; black coffee without sugar.

In addition to above, diabetics may eat the following:—

#### ADDITIONAL ARTICLES OF DIET

Meat—the muscle of beef, veal, mutton, game, poultry, tongue, heart, brain, marrow, sweetbread, gelatin and meat jellies. Fish of all kinds—caviar, cod-liver oil, clams, oysters, lobsters, crabs. Eggs (10 to 20 per cent. fat), animal and vegetable fats, bacon, suet, olive oil, butter (8 per cent. fat) which should be used on meat, eggs, spinach and other vegetables. Rich cream (milk contains milk sugar), all cheese, especially Swiss cheese. Vegetables—cress, tomatoes, cabbage, cauliflower, sprouts, artichokes, mushrooms, truffles, olives, onions, garlic, celery leaves, lettuce, cucumbers, and radishes. Fruits—only huckleberries, and young raspberries on account of sugar. Desserts—soufflés of eggs, gelatin, and lemon. Tea and coffee, diabetic cocoa (Rademenn's) and von Hoevel's saccharin chocolate, without sugar.

In mild cases the following articles in the following quantity are allowed:

#### QUANTITIES ALLOWED IN MILD CASES

Beans and peas (1 drachm); wax beans, turnips, carrots and celery root (1 ounce); walnuts (6), hazel nuts (10), almonds (8), (no chestnuts); oranges, lemons, plums, raspberries, strawberries, apples, pears, apricots, peaches, cherries in moderation; and milk or buttermilk, 1 glass.

#### FORBIDDEN FOODS

Liver, sugar, candy, maple sugar or syrup, pies, pastry, cake, jelly, preserves, stewed fruits, ice creams, syrups and molasses, thick gravies or sauces or soup, hot cakes, cereals including hominy, macaroni, vermicelli, breakfast foods, sago, tapioca, rice, dried beans, macaroni, sweet wines, ginger ale, sweet soft drinks, champagne and liqueurs.

#### BY PERMISSION

Whisky is allowable in moderate amount. Bread, crackers, and potatoes are allowed by permission of a doctor, in specified amounts.



The patient with diabetes should take such a diet, as the above test diet, for some weeks, and variety may be secured by replacing articles in the test diet by others in the list which all diabetics may take.

No patient should attempt to treat himself according to any book and the lists given are supplied for purposes of general information and convenience. The doctor will allow as much of the articles in the list for mild cases as the individual will tolerate.

Bread and potatoes are the articles most missed, and the amount the patient can take will depend upon his personal condition, as determined by urinary examinations. Saccharin may be used in place of sugar—which the patient may not take again during his life. The dose of saccharin is one and one-half grains daily. Occasional treats of bread and potatoes are allowable, and absolute fasting in bed from Saturday night until Monday morning is often beneficial.

There are various substitutes for common bread which contain somewhat less starch—as gluten, bran, aleuronat, and soya bread—but these are not very satisfactory generally, although bran and gluten bread are often palatable and may be eaten in large quantities.

#### DIET IN SEVERE CASES

In severe cases 8 ounces of well-cooked oatmeal, mixed with an equal weight of butter and the whites of 6 or 8 eggs, may be given as the sole diet in 4 meals in the twenty-four hours. Tea, coffee and a moderate amount of whisky may also be used as beverages in these cases.

The hygiene of the diabetic's life is important. While he should lead a quiet, even life it is better, in most cases, that he work than wander about the world after health. Warm clothing and an equable climate are advisable. The use of daily warm baths and frequent changes of underclothing render the occurrence of boils and skin eruptions less probable. Sea bathing and cold baths are inadvisable.

Diabetics frequent the foreign spas but this is not desirable except in those who have mild cases and are suffering also from other conditions, as obesity and gout, which may be benefited by the treatment given at mineral springs. All excesses are to be avoided, espe-

cially alcohol. Constipation is also most detrimental to diabetics.

The test of susceptibility to diabetes consists in the appearance of sugar in the urine after taking three ounces of glucose.

### OBESITY

To estimate the meaning of obesity a knowledge of the normal weight is necessary. In the table below is given the average weight of healthy men and women for different ages and heights.

A simple rule of insurance companies is that a weight of over three pounds to the inch in height is excessive, while a weight under two pounds to the inch in height is below normal.

#### TABLE OF HEIGHT AND AVERAGE WEIGHT AT VARYING AGES

*Based upon an Analysis of 74,162 accepted Male Applicants for Life Insurance, as reported to the Association of Life Insurance Medical Directors, 1897.<sup>1</sup>*

HEIGHTS	AGES									
	15 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69
5 ft. 0 in.....	120	125	128	131	133	134	134	134	131	...
5 ft. 1 in.....	122	126	129	131	134	136	136	136	134	...
5 ft. 2 in.....	124	128	131	133	136	138	138	138	137	...
5 ft. 3 in.....	127	131	134	136	139	141	141	141	140	140
5 ft. 4 in.....	131	135	138	140	143	144	145	145	144	143
5 ft. 5 in.....	134	138	141	143	146	147	149	149	148	147
5 ft. 6 in.....	138	142	145	147	150	151	153	153	153	151
5 ft. 7 in.....	142	147	150	152	155	156	158	158	158	156
5 ft. 8 in.....	146	151	154	157	160	161	163	163	163	162
5 ft. 9 in.....	150	155	159	162	165	166	167	168	168	168
5 ft. 10 in.....	154	159	164	167	170	171	172	173	174	174
5 ft. 11 in.....	159	164	169	173	175	177	177	178	180	180
6 ft. 0 in.....	165	170	175	179	180	183	182	183	185	185
6 ft. 1 in.....	170	177	181	185	186	189	188	189	189	189
6 ft. 2 in.....	176	184	188	192	194	196	194	194	192	192
6 ft. 3 in.....	181	190	195	200	203	204	201	198	...	...

<sup>1</sup>Prudential Life Insurance Co.

**TABLE SHOWING THE AVERAGE WEIGHT OF 58,855 INSURED WOMEN<sup>1</sup>**

HEIGHTS	AGES									
	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64
4 ft. 11 in.....	<b>111</b>	<b>113</b>	<b>115</b>	<b>117</b>	<b>119</b>	<b>122</b>	<b>125</b>	<b>128</b>	<b>128</b>	<b>126</b>
5 ft. 0 in.....	<b>113</b>	<b>114</b>	<b>117</b>	<b>119</b>	<b>122</b>	<b>125</b>	<b>128</b>	<b>130</b>	<b>131</b>	<b>129</b>
5 ft. 1 in.....	<b>115</b>	<b>116</b>	<b>118</b>	<b>121</b>	<b>124</b>	<b>128</b>	<b>131</b>	<b>133</b>	<b>134</b>	<b>132</b>
5 ft. 2 in.....	<b>117</b>	<b>118</b>	<b>120</b>	<b>123</b>	<b>127</b>	<b>132</b>	<b>134</b>	<b>137</b>	<b>137</b>	<b>136</b>
5 ft. 3 in.....	<b>120</b>	<b>122</b>	<b>124</b>	<b>127</b>	<b>131</b>	<b>135</b>	<b>138</b>	<b>141</b>	<b>141</b>	<b>140</b>
5 ft. 4 in.....	<b>123</b>	<b>125</b>	<b>127</b>	<b>130</b>	<b>134</b>	<b>138</b>	<b>142</b>	<b>145</b>	<b>145</b>	<b>144</b>
5 ft. 5 in.....	<b>125</b>	<b>128</b>	<b>131</b>	<b>135</b>	<b>139</b>	<b>143</b>	<b>147</b>	<b>149</b>	<b>149</b>	<b>148</b>
5 ft. 6 in.....	<b>128</b>	<b>132</b>	<b>135</b>	<b>139</b>	<b>143</b>	<b>146</b>	<b>151</b>	<b>153</b>	<b>153</b>	<b>152</b>
5 ft. 7 in.....	<b>132</b>	<b>135</b>	<b>139</b>	<b>143</b>	<b>147</b>	<b>150</b>	<b>154</b>	<b>157</b>	<b>156</b>	<b>155</b>
5 ft. 8 in.....	<b>136</b>	<b>140</b>	<b>143</b>	<b>147</b>	<b>151</b>	<b>155</b>	<b>158</b>	<b>161</b>	<b>161</b>	<b>160</b>
5 ft. 9 in.....	<b>140</b>	<b>144</b>	<b>147</b>	<b>151</b>	<b>155</b>	<b>159</b>	<b>163</b>	<b>166</b>	<b>166</b>	<b>165</b>
5 ft. 10 in.....	<b>144</b>	<b>147</b>	<b>151</b>	<b>155</b>	<b>159</b>	<b>163</b>	<b>167</b>	<b>170</b>	<b>170</b>	<b>169</b>

<sup>1</sup> Prudential Life Insurance Co.

Weight is of importance in respect to age. Heavy weight in persons over forty is a decided disadvantage from a life insurance point of view, their death rate being much above the average. On the other hand individuals of light weight past middle age have as good an expectancy of life as those of normal weight. Young persons under weight, especially if there is a history of consumption in the family, have a mortality much above the average. In young persons, otherwise healthy and of good physique, overweight is not unfavorable from the insurance viewpoint—unless the abdominal measure exceeds that of the chest, which is undesirable at all ages. Insurance statistics show that certain diseases, as heart disease, bronchitis, constipation, piles, diabetes, gout, stone in the kidney and Bright's disease of the kidney, occur more often in the stout after middle age. Hardening of the arteries and apoplexy are more frequent in the obese, and they have less resistance to surgical operation and acute diseases, as pneumonia and typhoid fever. For these reasons the insurance companies reject or handicap overweight individuals



at or after middle age, unless there is a family history of obesity with longevity.

**Causes.**—In a general way overeating and lack of exercise is responsible for much fatness. Heredity is important. The secretions of certain glands in the body are absorbed into the blood and increase or diminish the tendency to fat formation. Thus when either sex is castrated (removal of either the testicles or ovaries) the secretions of these glands are stopped and stoutness is apt to follow. The same result occurs at the change of life in women when the ovaries cease to secrete. Stoutness is seen in eunuchs and in women whose ovaries are removed in early life for disease. With partial removal (posterior lobe) or disease of the pituitary gland at the base of the brain there is great increase in weight. Giants are formed through disease of this gland. Great obesity in children is frequently due to disorder of the pituitary gland and is often associated with poor sexual development.

On the other hand, an excess of secretion of the thyroid gland in the neck produces emaciation (*See Goiter*) and the dried sheep's gland is sometimes given to reduce obesity in man.

**Symptoms.**—The physical inconvenience caused by obesity and the injury to the figure in women are the common complaints. Walking and exertion of all kinds are difficult, while the breathing is short and the heart's action is embarrassed. The pulse is apt to be more rapid, and the urine is scant compared with the amount of fluid taken,—because of easy perspiration, and for the same reason, colds are more frequent. Indigestion may develop, and constipation and piles are common. Impotence sometimes occurs in the male. Sleepiness is frequent in fat young people, as made famous by the fat boy in "Pickwick Papers." Common observation shows us, however, that obesity is compatible with not only long life but with great activity and vigor.

**Treatment.**—All reduction cures are starvation cures. None supplies enough food for the permanent needs of the body. It is a reduction of quantity rather than quality of food which counts; still the kind of food is of importance. The amount of food given in reduction cures is equal to from one-half to as low as one-third of



that required to maintain a normal individual. The fat of the body is thus burned up to supply the individual's needs. The danger lies in the fact that not only the fat but the substance of the muscles and tissues generally may also be broken up if the starving is continued too long. If this happens the subject will feel weaker. No reduction cure should be continued unless the patient feels stronger for it. Frequent meals tend to prevent a feeling of weakness. As a general rule dieting is not advisable for persons over fifty or under twenty years of age. Those who have been fat for a great many years are not favorable subjects for reduction. While reduction is always better undertaken with a physician's care it should never be carried out by the patient unless otherwise in good general health. The reduction of fat in certain disorders, as in diabetes and consumption, might be fatal.

A patient should not lose more than six to eight pounds a month for two or three months; then the diet may be increased so that the weight is maintained at a level for two months, and the cure instituted again. None but robust individuals should lose as much as forty or fifty pounds in a year and they should feel stronger for it. Fatness in children should be discouraged by the avoidance of sweets, starches—as cereals, and fats—and by the use of outdoor exercises, but not by a strict diet.

Food is generally divided into fats, starches, sugar, and proteids. The last include pure meat and fish—free from fat—skim milk, white of egg, and a portion of vegetables, as gluten in flour. Proteids build tissue in the growing and repair it in adults, but do not ordinarily make fat. Sugar, starches, and fat make fat and must be chiefly cut out in the reduction diets.

In the following diet list the fat is but one-third to one-half and the starches and sugars but one-fifth to one-half of the amount required in a normal diet, while the amount of proteids is about the standard for normal adults. The special diets given in most medical textbooks are of German origin, as Oertel's, von Noorden's, Ebstein's, etc., and include articles often not palatable to us, as cold meat for breakfast, Rhine wines in considerable amount, etc.

The following diets are often advised.

The Oertel cure requires that the liquid be reduced to two and one-half pints, including water and all other fluids taken in the twenty-four hours, thus:—

BREAKFAST:—6 ounces of tea or coffee with milk; 3 ounces of bread.

LUNCH:—3 to 4 ounces of soup; 7 to 8 ounces of meat; a little fish; 1 ounce of bread or sago, rice, tapioca pudding; 3 to 6 ounces of fruit for dessert; 1 glass of water.

AFTERNOON TEA:—6 ounces of tea and a glass of water; 1 ounce of bread.

SUPPER:—1 or 2 soft boiled eggs; 1 ounce of bread; small slice of cheese; salad; fruit; 1 to 2 glasses of liquid.

von Noorden's diet follows:—

BREAKFAST, 8 A.M.:—Lean meat— $2\frac{2}{3}$  ounces; 1 cup of tea, with spoonful milk, no sugar; bread— $\frac{5}{6}$  of an ounce.

TEN A.M.:—1 egg.

TWELVE M.:—1 cup of strong meat broth.

ONE O'CLOCK:—A small plate of vegetable and meat soup; 5 ounces of meat and fish; 3 ounces of potatoes with salad; 3  $\frac{1}{3}$  ounces of fresh fruit without sugar.

FOUR O'CLOCK:— $6\frac{1}{2}$  ounces of fresh fruit.

SIX O'CLOCK:— $\frac{1}{2}$  pint of milk with tea.

EIGHT O'CLOCK:—4 ounces of cold meat or 6 ounces of raw meat cooked and eaten with salad; 1 ounce of Graham bread; 2 or 3 spoonfuls of cooked fruit without sugar.

The amount of liquids as water, weak tea, or lemonade at or between meals is not limited. von Noorden believes the numerous small meals prevent weakness.

Bouchard's diet consists wholly of the following:

$2\frac{1}{2}$  pints of milk and 5 eggs per day—in other words, a glass of milk and 1 egg at 7 and 11 A.M. and 3, 7 and 11 P.M. for 20 days.

Most of the diets cut down on starches, fat, and sugar required in a normal diet while increasing from one-third to one-half the amount of proteids as represented by meat, fish, milk and egg. They represent about one-half the food value required by the normal person.

The so-called milk cure is one of the simplest diets and may be used also in disease of the heart or kidneys (omitting meat in the latter) as it increases the action of the kidneys and is particularly applicable in the case of persons with much abdominal fat.

#### MILK CURE DIET

BREAKFAST:—1 pint of milk.

LUNCH:—6 ounces of lean meat with green vegetables, as spinach, green peas, string beans, lettuce (no bread or potatoes, but beets, turnips, parsnips, cabbage, Brussels sprouts, or carrots may be used in place of green vegetables);  $\frac{1}{2}$  pint of milk; 2 glasses of water or cups of tea with a little sugar.

FIVE P.M.:— $\frac{1}{2}$  pint of milk or junket; 2 cups of tea with a little sugar.

SUPPER, 7 P.M.:—1 pint of milk and 2 apples (they may be cooked).

In place of the mid-day meal only a pint of milk may be taken in the case of robust persons. If the subject remains at home he may take the milk more frequently—8 to 9 glasses daily—with only the apples, tea, and water—if the noon meal is abstained from.

Ebstein's diet contains three pints of liquid, including two cups of tea, as follows:

BREAKFAST:—Bread—2 ounces with plenty of butter (bread may be toasted); large cup of tea at end of meal, without sugar.

LUNCH:—Fat meat, ham or fish—4 oz., or 1 egg; bread-and-butter—1 oz.; green vegetables or salad and fruit.

TEA:—1 cup of tea; 1 slice of bread-and-butter, or biscuit.

DINNER:—Clear soup; meat—5 or 6 oz.; cabbage, peas, string beans, or spinach, as much as wanted; raw fruit or salad; small piece of cheese and a cup of tea at end of meal.

Five glasses of water should be taken between meals. This diet allows fats but excludes starches and sugar, and contains half the normal food requirements.

Dr. E. A. Locke's diet has been found by the writer the most sensible and is in accord with our customs. It follows:—

BREAKFAST:—1 cup of black coffee (no cream or sugar); 1 or 2 boiled or poached eggs; 1 or 2 small slices of toast without butter; an orange, apple, pear, or  $\frac{1}{2}$  grapefruit.

ELEVEN-THIRTY A.M.:—1 glass of milk, buttermilk or some fruit.

LUNCHEON:—1 cup of clear soup; 3 ounces of meat, eggs or fish; 2 varieties of green vegetables—2 to 4 ounces each; raw fruit.

FIVE P.M.:—Tea, without cream or sugar; 1 small slice of toast.

DINNER:—Raw oysters; lean meat or fish—4 to 5 ounces; 2 green vegetables—2 to 4 ounces each; salad of fruit or vegetables with a small amount of French dressing; raw or unsweetened cooked fruit; demitasse of black coffee.

#### ARTICLES TO BE AVOIDED

STARCHES:—White potatoes—except in small amount—bread, crackers, cereals, macaroni, vermicelli, spaghetti, sago, tapioca, corn starch, sweet potatoes, shell beans, dried peas or beans, corn and nuts.

SWEETS:—Sugar, candy, dried fruits, syrups, fruit preserves, honey, marmalade, and sweet sauces.

MEATS:—Pork, bacon, goose, sausage, croquettes.

FISH:—Shad, fresh salmon, eels, sardines, mackerel, blue fish, and fried fish.

FATS:—Butter, cream, olive oil, bacon, lard, fat meat, and fish.

DESSERT:—Ices, rich puddings, cake.

MISCELLANEOUS:—Chocolate, alcoholic drinks—except claret and Rhine wine—thick soups, milk, cheese, pickles, condiments.

This diet contains one-third to a little over one-half the food value required by a normal person weighing one hundred and fifty pounds. For a heavy person the food is correspondingly deficient so that he will live on his fat while on the diet.

Water is not curtailed in Locke's diet, as in many diets for reducing fat, but water should only be taken after rising, between meals, and at bedtime.

Water taken at meals increases the appetite, and some authorities believe the absorption of food as well.

It is advisable that the patient should actually weigh his food at first and then he can judge later of the amount he should take by bulk. The patient should weigh himself daily and keep a weekly chart of his weight. The appetite will be hard to curb at first but after a few weeks there should be no trouble on this score and the strength and appearance should improve. Prolonged chewing lessens the appetite.



The diet may be followed until the weight becomes normal for the height of the subject; then the diet may be somewhat increased, being careful not to take too much sugar, fat, and starches—as potatoes and bread.

Exercise in a heavy sweater is imperative during the cure, and swimming, riding, golf and walking, occupying three-fourths of an hour in the morning and one-half hour in the afternoon, are recommended. Massage will to some extent reduce local accumulations of fat, as on the abdomen, but it must be given daily and very vigorously for this purpose. Special exercises are more efficient, as exercises in bending over for removal of fat on the abdomen. Sometimes cathartics are necessary, especially on cutting down the bulk of food. Some saline, as Carlsbad salts in one-half teaspoonful doses (more or less) in a glass of cold water on rising, is suitable.

The whole success of the treatment depends upon the faithfulness with which it is carried out. If thoroughly done the habits will become so changed that it will not be difficult to adhere to a proper diet thereafter.

#### BERIBERI

Beriberi is a peculiar disease resulting from disorder of nutrition, owing to the absence of certain unknown elements, or vitamins, in the food.

Vitamins are substances existing in food and essential to life. Certain disorders, as rickets and scurvy in children, scurvy in adults, softening of the bones in pregnant women, pellagra and beriberi, are caused by food deficient in these substances. Grains, as wheat, rice, barley and oats, when deprived of their germ and outer coating, will produce beriberi in many birds and animals. Vitamins are also destroyed by heat and by drying and pickling.

**Causes.**—In the case of beriberi, experience and experiments indicate that a diet of rice, from which the outer coat, containing the germ, has been removed, is the more common cause. This is called white rice or polished rice and is what we ordinarily use. In the preparation of white rice, it is steamed, the outer covering bursts, the grain is dried, the hulls are removed, and the rice is polished in milling. Red rice, covered by its natural coats,

will not induce beriberi. The most interesting experiments have been tried on large numbers of persons, as in the case of the inmates of the insane asylum at Singapore, where formerly half of them died of beriberi. It was found that the disease could be produced or cured at will by feeding first polished and then unpolished rice.

In India a group of men was given polished, white, Siam rice, and they developed beriberi in sixty days, while another group living under the same conditions, but eating only unpolished rice, remained free from the disease. But when this second group was fed polished, white rice beriberi developed within two months. By exchange of clothing and contact of the well with the sick it was shown that the disease was not infectious or contagious.

The same results have been obtained in Japan and the Philippines. As many as 50,000 cases of beriberi arose from the feeding of polished rice to the Japanese during the Russian war, but recent knowledge of the cause of the disease has enabled the authorities to stamp it out.

Osler states that "there has been no more remarkable triumph of modern hygiene than Takagi's dietetic reforms in the Japanese navy." Schaumann and others went further and concluded that deficiency in phosphorus, as it occurs in combination in vegetable or animal tissue, is the true cause of the disorders of nutrition above mentioned. He and others found that rice which contained less than 0.4 of one per cent. of phosphorus is likely to produce beriberi. This conclusion has not been wholly accepted since Funk claims to have isolated a new substance, or true vitamine, the deficiency of which in food is the cause of beriberi and which does not contain any phosphorus.

It is unquestionably a fact that the feeding of the polishings or bran of rice will cure beriberi and it seems probable that food contains often more than one vitamine and that various kinds are essential to life. Thus in milk there is a vitamine which is destroyed by heating, and pasteurized milk may cause scurvy. But there are other vitamines in milk which survive heat, for in dried milk the vitamines are still present that will cure beriberi and that are essential for growth of young animals. When there

is a deficiency of vitamine in food the animal or man must use up that already in the body so that some of the tissues are damaged. In the case of beriberi it is the nervous system which becomes involved.

At present we must confess our ignorance of the precise nature of vitamines, although evidence points to either phosphorus or nitrogen as being their most likely chemical constituents; but we do know that many foods contain essential unknown substances which are destroyed by removal of the germ and hulls of grains, or by boiling, heat in any form, drying, canning and pickling, and that deficiency of these bodies in food gives rise to the diseases already enumerated. We also know that while rice hulls contain the essential vitamine curing beriberi, the vitamine curing scurvy resides in fresh vegetables and fruits, as in fresh onions, potatoes, cabbage, lemons, limes, oranges, apples, etc.

White bread, deprived of its bran, cerealine, and the germ of the grain, is the most important food from which vitamine is removed, but all sorts of prepared foods in which the hulls are taken from grains or in which heat is used, as condensed and dried milk, dried eggs, infant's and invalid foods, vegetable and meat extracts, and canned food or dried or pickled meat, are deficient in vitamines and instrumental in causing the disease noted above. This explains the reason for beriberi developing on ships where the crew live on pickled meat, dried potatoes, rice, white flour bread and biscuit.

Beriberi has occurred most extensively in the Orient, the Chinese and Japanese subsisting largely on a rice diet. The disease has existed in the Philippines, India, and South America, among fishermen in Europe and on the Newfoundland Banks, on shipboard, and in this country in camps, mines, and asylums. It does not develop in persons living on a varied and mixed diet and in good surroundings and circumstances. Poverty, overcrowding, low altitude, heat, and exposure to wet favor the disease, but a diet deficient in special substances or vitamines is the real cause.

In the Philippines the United States Government authorities, who have made elaborate experiments, are convinced that not only is polished rice the cause, but that deficiency in phosphorus is the



essential cause, and that any rice which contains less than 0.4 of one per cent. of phosphorus may be regarded as polished.

**Duration—Mortality.**—Beriberi takes from twenty days to two to four months to develop and may last many weeks or months. The death rate varies tremendously—from 2 to 50 per cent.

**Symptoms.**—The disease is essentially an inflammation of the nerves throughout the body (polyneuritis). It begins like a bad head cold with pains, swelling, and loss of sensation in the limbs. There may be complete loss of sensation and power in the arms and legs although pain, crawling sensations, and other peculiar feelings are common in the limbs. The muscles are tender and may waste away, or there may be extreme dropsy and the whole body swell. The breathing becomes difficult, the heart is weak and the pulse rapid.

**Prevention.**—Prevention consists in change in the diet depending upon the cause—in most cases this will be the substitution of unpolished or red rice for polished, white rice.

The Government in the Philippines has forbidden the use of polished rice among the native troops and in its institutions. Thus in the leper colony there were 309 deaths in 1910 from beriberi but after changing the diet from polished to unpolished rice not a single case of the disease developed in the following year. There is also a duty of two and one-half cents a kilo (2.68 pounds) on polished rice imported into the Philippines, in order to discourage the natives from using it.

**Treatment.**—Improvement in the general hygienic conditions is essential in the treatment of beriberi. In addition the use of tea made from rice hulls or polishings, or when a liberal diet is possible this diet may be given without rice.

It is a very chronic disease and treatment in hospitals is advisable. There is dropsy or fluid in the cavities of the chest and belly, so that rest in bed and saline cathartics tend to drain away the fluid, while heart stimulants are often required.

#### SCURVY

Scurvy used to be much more common than it is now. In the Civil War there were nearly 50,000 cases in the Union Army.



Sailors and soldiers have been the common victims, but now the disease occurs most often among the poorly fed, on shore.

**Causes.**—A diet of bread, meat, and coffee will cause scurvy (McGrew). The precise cause is unknown although it is commonly said to be produced by a diet containing neither fresh meat, vegetables, preserved vegetables, nor vegetable juices. In the absence of vegetables, limes, lemons, or oranges will prevent the disease. Nansen's party escaped scurvy by eating fresh bear's meat and blood.

It is also thought that poisonous substances in the food may occasion scurvy, as tainted meat has experimentally produced in monkeys a disease resembling it.

Scurvy is due to deficiency of some essential substances in the food or of one of the vitamins (*See Beriberi*). Cooking, heating, drying, and processing in the course of manufacturing food products destroy the substances which prevent scurvy. Food which is kept a long time may cause scurvy, so that substances which exist in *fresh* food protect against scurvy: fresh meat and blood prevent scurvy in the absence of vegetables and fruit juices.

Animals fed for weeks on flours of various grains, minus their hulls, or on potatoes which have been dried and then boiled, develop scurvy. Milk which is only heated to pasteurizing temperatures (145° F.) or higher for thirty minutes, will cause scurvy in children unless orange juice or juice of fresh meat is fed at the same time. These contain the vitamins preventive of scurvy, rickets and malnutrition.

Scurvy in infants is usually caused by pasteurized, condensed or boiled milk or infant foods of all kinds, although it occasionally develops from the mother's breast milk—probably depending upon lack of vitamins in the mother's food. Cabbage juice loses its antiscorbutic (against scurvy) action when it is heated to 145° F., but lime juice boiled one hour still contains its vitamin against scurvy. Because lime juice holds its antiscorbutic property so tenaciously, it is employed as the great preventive of scurvy on English ships, popularly called "lime juicers."

Many authorities think that phosphorus is the essential vitamin

in food which prevents scurvy and pellagra, as well as the beriberi. However, this is still but an hypothesis. Certain conditions, as fatigue, cold, damp quarters, mental depression and home-sickness, favor the development of the disease. It attacks all ages, but is most severe in the old.

**Symptoms.**—Scurvy begins with general weakness and paleness. The skin grows dry and has a dirty hue, the gums become swollen, tender, spongy, and bleed easily, and later they may ulcerate and the teeth may loosen and drop out. The tongue swells and saliva flows freely. The appetite is poor and chewing painful, and the breath has a bad odor. The ankles swell, and bluish spots appear on the legs which may be raised in lumps above the surface; the patient suffers from pain in the legs, which sometimes become swollen and hard; the blue spots are also seen on the arms and body, and are due to bleeding under the skin, and are induced by the slightest bruising. Occasionally there is bleeding from the nose and bowels; the joints are often swollen, tender, and painful. Constipation is rather the rule, but in bad cases there may be diarrhea, nausea, and vomiting, and the victim becomes a walking skeleton. Mental depression or delirium may be present.

**Treatment.**—Recovery is usually rapid and complete, unless the disease is far advanced. Soups, fresh milk, beef juice, and juice of two or three lemons or oranges may be given daily at first, when the digestion is weak, to be followed later by green vegetables, as spinach (with vinegar), lettuce, or carrots, onions, cabbage, and potatoes.

The soreness of the mouth may be relieved by a wash containing one teaspoonful of carbolic acid to the quart of hot water. This should be used to rinse the mouth several times daily, but must not be swallowed. Painting the gums with a two per cent. solution of silver nitrate in water, by means of a camel's hair brush, twice daily, will also prove serviceable.

As a tonic, a two grain quinin pill and two five grain Blaud's pills of iron may be given three times daily.

Scurvy is frequently mistaken for either rheumatism or paralysis in babies.

## INFANTILE SCURVY

Scurvy occasionally occurs in infants between three weeks and eighteen months of age, and is due to feeding patent foods, condensed, malted, pasteurized or sterilized milk. In using sterilized or pasteurized milk, if the baby is given orange juice, as advised under the heading Food for Infants and the Sick, scurvy will not develop.

It is now certainly known that feeding cooked milk to babies causes scurvy, as has long been the conviction among baby specialists, and it is advised that at least three tablespoonfuls of orange juice should be fed daily with pasteurized or sterilized milk.

**Symptoms.**—The lower limbs become painful, and the baby cries out when he is moved. The legs are at first drawn up, and become swollen all around the part just above the knees, and there may be swelling of the knee-joints themselves. Later the whole thigh becomes swollen, and the baby lies without moving the legs, with feet rolled outward, and he appears to be paralyzed, although it is only pain which prevents movement of the legs.

Sometimes there is swelling about the wrist and forearm, and the breast bone may appear sunken in. Purplish spots appear on the legs and other parts of the body, but may be absent until late in the disease. The gums, if there are teeth present, become soft, tender, spongy, and bleed easily. There may be slight fever, the temperature ranging from 101° to 102° F. The babies grow exceedingly pale and restless, and lose all strength.

**Treatment.**—The treatment is very simple, and recovery rapidly takes place. The feeding of all patent baby foods, and of condensed or sterilized milk must be instantly stopped. A diet of unheated milk, beef juice, and orange juice, at least one tablespoonful three times daily as directed under the heading, Food for Infants and the Sick, will bring about a speedy cure.

## PELLAGRA

This is a peculiar disease. It had its beginning in Spain (1762), spreading to Italy and France, and within six or more years has become quite prevalent in the southeastern part of the United States.



**Causes.**—Pellagra is not contagious nor is it conveyed by flies or other means. It was formerly thought to be due to eating Indian corn, especially spoiled corn. Recently the United States Public Health Service has declared the cause of pellagra to be the eating of too much starch, or in other words, the lack of protein and vitamins—especially during the winter months in the South.

The disease is more common in the spring and fall, and return of the disorder is also frequent at these seasons. It occurs in persons more often between the ages of twenty and forty.

**Symptoms.**—The digestion, skin, and nervous system are particularly affected. The patient grows weak and depressed and has headache. The digestion fails and there is soreness in the mouth, nausea, vomiting, and painful, watery or bloody diarrhea. The skin on the backs of the hands, face, neck, and feet becomes red and puffy and looks as if it were badly sunburned; later it peels, and the skin is left thickened and reddened. In the more severe cases blisters form. The nervous symptoms include headache, dizziness, mental depression, irritability, change in disposition and failure in mental powers, so that the patient hears imaginary voices or sees imaginary objects.

Severe cases occur with fever, stupor, delirium, and death, within a few weeks. Chronic cases recur in the spring and fall from year to year, with failing mentality in many instances, so that patients become inmates of insane asylums.

**Prevention and Treatment.**—It is affirmed that if the inhabitants in the pellagra section will eat sufficient lean meat, eggs, milk, and fresh or dried peas and beans, the disease will be prevented and in most cases patients will be cured by such a régime.

Healthy persons living in the pellagra section should see that their diet contains a liberal amount of lean, fresh meat, milk, eggs, and beans and peas, dried in winter, but not canned. By such means the disease may be prevented. Corn should be eaten in but small amounts, as it is too rich in starch. The Japanese beriberi is an analogous disease apparently caused by eating polished rice, a pure starch diet containing no vitamins.

A daily winter diet for patients of six glasses of milk, four eggs,



and one-half pound of lean meat, with dried peas and beans or pea or bean soup, is used as a cure. Patients with little digestive difficulty may take, in addition to the foregoing, fruits, potatoes, onions, rice, oatmeal and wheat and rye bread—but no corn in any form.

### GOUT

Gout is a disease of assimilation, apparently caused by retention of uric acid and allied substances (purins) in the body, and characterized by a tendency to deposit salts of uric acid (sodium biurate) in the joints and tissues, especially in the first joint of the great toes.

Following repeated acute attacks of severe pain and swelling in the great toe joints, extending over years, the disease is apt to attack other joints and produce degenerative changes in the blood vessels, kidneys, and heart, and a great variety of other irregular general symptoms.

**Causation.**—There are certain chemical substances called purin bodies, of which uric acid is one, which are derived about equally from food and chemical changes in the tissues of the body. Uric acid, then, is a substance naturally present in the body; but in persons having a gouty tendency there is inability to either burn up (oxidize) uric acid, or to freely eliminate it from the kidneys. Uric acid in the gouty collects in the blood and is deficient in the urine—except during acute attacks of gout.

Purins are naturally oxidized in the bodies by certain substances called ferments (as yeast, or pepsin of the gastric juice). The ferments destroying uric acid are chiefly found in the liver and kidney, and the excess of uric acid in the blood of the gouty may be attributed to imperfect action of the liver ferments in destroying purins and to retention of them from impaired action of the kidney ferments.

This explanation is indeed chiefly theoretical at present, and some think the excess of purins in the blood due to the presence of bacterial growth in the bowels (colon bacilli). It is also unknown whether gout is due to uric acid alone or to other purins.

The damage done by uric acid is thought to be due to mechani-

cal irritation, as it is not poisonous when swallowed or injected into the blood. The blood and fluids of the body are alkaline so that uric acid never exists as such in the body, but always in the form of a salt (sodium biurate). If the blood were made acid, death would immediately occur.

Purins are derived chiefly from the contents of the cells of animal tissue (nucleoproteids), although to a much less degree from some vegetable cells. Thus milk, cheese, bread, butter, and potatoes are free from purins while the maximum amount found in peas, beans, and oatmeal is four grains to the pound; in meat there is twice this amount; while in liver, kidneys, brains, and sweetbreads the quantity is much greater—seventy grains to the pound in sweetbreads. Beef extract contains a considerable amount of purin bodies, and the active principle of tea, coffee, and chocolate is a purin (caffein).

**Predisposing Causes.**—Heredity is responsible for about sixty per cent. of cases, commonly from the father—as gout is six times more frequent in the male. Indolence, and excessive eating and drinking, particularly produce gout. It was at its height during the acme of dissipation in ancient Rome. An old verse has it that “Wine was the father, Eating the mother, and Venus the midwife of gout.”

In more modern times there has been more gout in England than in all the rest of the world together (Lindsay); France follows next, while in this country gout has been thought rare—but Fitcher found it only one-third less prevalent in Baltimore than in London.

Strong wines and malt liquors taken with heavy meals appear to especially favor gout. Excessive tippling alone does not lead to gout, and in Ireland and Scotland the consumption of whisky does not cause it, as do ales, porters and port wine in England. Sweet champagnes and Burgundies are gouty, but light wines are much less so.

**Occurrence.**—Previous lead poisoning and injuries to joints appear to predispose persons to gout. Gout begins in middle life (30 to 50) and on an average ten years later in women than in men.

(There were about four cases in the Massachusetts General Hospital among 28,000 patients in ten years, but it is not a disease affecting hospital patients.)

ACUTE ATTACKS.—There may be certain premonitions, as twinges of pain in fingers or toes, restlessness at night, asthma, sore throat, cough, indigestion, headache, mental irritability, and passage of high-colored urine.

The patient is awakened in the early morning hours with agonizing pain in the first joint of the great toe, more often the right. The pain is burning, or as though the parts were held in a vise. The toe swells and is red, hot, and tender, but never develops into abscess formation; the pain usually abates as the morning wears on, only to recur each morning for several days, and perhaps a week. The trouble may then cease and the patient feel most unusually well, but similar attacks may be repeated in the spring and fall, or three or four times a year.

Proper diet and exercise may avert further attacks; on the other hand, any excess in eating or drinking (even a single glass of champagne), injury to the joints, mental worry or shock, may precipitate a seizure.

During an acute attack the other toe may become involved and in later seizures the other joints, as the ankle, knee, wrists, thumbs, and small joints of the hands. In an attack the uric acid is deposited in the joint, first in a form which tends to set up an acute inflammation, and if the disease becomes chronic, the salt of uric acid (sodium biurate) is found in a pure state in the ligaments and cartilages of joints, and sometimes the skin is destroyed over the knuckles of the fingers so that lumps of chalky matter come away.

During the acute seizure there may be general symptoms as fever (temperature  $100^{\circ}$  to  $102^{\circ}$  F.), vomiting, abdominal cramps, flatulence, loss of appetite, and furred tongue. Rarely do serious symptoms appear, as violent abdominal pain, vomiting and diarrhea, or pain about the heart with difficult breathing, or delirium and unconsciousness. These have been attributed to the attack not spending itself externally but "striking in," when too rapid disappearance of the trouble in the toe is experienced. Such grave



conditions are now thought to be due to changes in the heart, kidneys, blood vessels, brain, etc., from the effects of the disease.

**CHRONIC GOUT.**—Chronic gout usually follows repeated attacks of the acute form, but occasionally in the old, the weak, and in women, the trouble is chronic from the beginning.

There are permanent painful swellings of the joints of the hands and feet, and perhaps of the knee, elbow, and spine, but rarely of the knee or hip. These may be subject at times to increased pain, redness, and swelling with fever.

This form of gout may be mistaken for the many other forms of chronic joint disease called commonly rheumatic, if the patient has not had the typical acute attacks of gout described above. The true diagnosis can only be made as noted below.

**Goutiness or Complications of Gout.**—In persons who have inherited the gouty tendency, and those who have lived in a manner to acquire gout, there may be various irregular symptoms of the disease without the occurrence of a typical attack. Thus such persons are subject to so-called biliousness or indigestion with nausea, furred tongue, bad taste in the mouth and constipation, and also to eczema, hardening of the arteries, apoplexy, chronic kidney and heart disease, with irregular pulsations and palpitation of the heart.

Nervous symptoms are also frequent in gouty people, as hot and itchy or “fidgety” feet at night, or hot and itching eyeballs, cramps in the leg, headache, neuralgias, and sciatica. Uric acid is often deposited as stone in the kidney, and bronchitis and eye inflammations are frequent occurrences. Obesity and diabetes are not rarely complications.

The deposit of the salts of uric acid in various parts of the body is commonly observed, especially in the form of small, whitish lumps at the edge of the rim surrounding the upper half of the ear.

**Diagnosis.**—When a person has had the typical attacks of severe pain and swelling in the great toes the diagnosis is easy, but these are often absent in gout. With chronic joint disease, not starting in the feet, the history of alcoholic excess in a male and the presence of the nodules in the ears would suggest gout, but careful study by a physician is required to make a satisfactory diagnosis.



In no other joint disease are accumulations of chalky matter seen, as in the knuckles and other parts in gout. In women past the "turn of life" it is common to find small painless lumps on the last finger joints, but these are due to so-called rheumatic gout (*see separate heading*), which has no relation to true gout. In countries where gout is prevalent the existence of chronic disease in many joints in men is more apt to be gout than any other disorder.

The irregular forms of gout are the most difficult of diagnosis. Only when there is a plain history of typical gout in the family may one be justified in referring so many diverse ailments to gout. The "uric acid diathesis" and "lithemia" are terms which have fallen into disuse and disrepute, since they mean nothing. An excess of uric acid in the urine has ordinarily no significance. In gout the study of the elimination of uric acid in the urine is of value in diagnosis, but it can only be undertaken by the laboratory medical man and not by the ordinary practitioner, and the patient must be put on a special diet. The use of the x-ray is of great value in diagnosis.

**Outlook.**—Patients with gout may live to old age, but in any special case the condition of the heart, blood vessels, and kidneys will give the best indications as to the lease of life. The outlook is better when the disease begins after forty and in acute rather than in irregular gout. Through care as to diet, exercise, and mode of life, the severity and frequency of attacks may be much diminished.

**Treatment.**—As gout is one of the diseases in which "the sins of the fathers" are often paid for chiefly by the children, it is well to begin preventive treatment by bringing up the offspring of gouty ancestors in the country so that they may have plenty of exercise in the fresh air and sunshine. After adult life is reached there should be moderation in eating, both in regard to the general quantity and the amount of meat. Eating an excess of food favors gout—especially an excess of meat.

Food free from purins is the ideal diet, as milk, butter, bread, cheese, cream, eggs, fresh vegetables, and fruits (except strawberries). Light and dark meats contain about the same amount of purins as

does fish. A small amount of fish or meat may be allowed once daily. There is no trace of purins in green vegetables and the only vegetables which contain much are peas and beans. Tea and coffee contain between one and two grains to the cup, as against eight grains of purins in a pound of meat.

An abundance of water is also a prime requisite in gout, and this is one of the chief benefits derived from going to "springs" rather than any special merit in the particular water.

The articles rich in purins, as brains, sweetbreads, liver, kidneys, clear soups, fish roe, and caviar, are those particularly to be avoided by the gouty. Starch and sugar contain no purins, and may be taken in moderation. An excess of tobacco hinders the elimination of uric acid, and is bad for persons with gout. Alcohol in any form is detrimental to the gouty, but especially malt liquors, heavy wines—as Burgundy, port, Madeira, champagne, and sherry. Agreeable outdoor exercise is most desirable, as walking, golf, riding, and, when the feet are disabled, rowing or canoeing, or gymnasium exercises.

In an acute attack of gout the foot should be kept raised on a pillow and, when the patient is in bed, an arrangement must be used (cradle) to keep the clothes from pressing on the foot. Cloths wet in water, in which is dissolved as much Epsom salts as possible, may be kept about the foot and surrounded by rubber cloth or oil silk and loose bandage. In some cases a thick covering of absorbent cotton and bandage, and the application of a hot water bag outside all, will give most relief.

A single dose of two grains of calomel, followed in eight hours by a Seidlitz powder or bottle of magnesium citrate, is always useful at the beginning of an attack.

The diet should be chiefly milk, barley water, toast, and soft eggs for a week following an acute attack. In chronic gout drugs are not of much value. Proper living with respect to diet and general hygiene are most important. While gout is more often a disease of the well-to-do, it is seen in the very poor who drink malt liquors and in the descendants of gouty ancestors who live the most exemplary lives.

## CHAPTER VI

### RHEUMATISM AND ALLIED DISEASES

Rheumatic fever. Muscular rheumatism. Lumbago. Stiff neck. Rheumatism of the chest. Chronic deforming joint disease.

#### RHEUMATIC FEVER

*(Inflammatory Rheumatism—Acute Rheumatism)*

**Causes.**—This variety of rheumatism is quite distinct, being in all probability due to special germs (streptococci). It occurs in temperate climates during the fall, winter, and spring—less often in summer. Persons more often suffer between the ages of ten and forty years. It is rare in infants; their pain and swelling of the limbs can be attributed more often to scurvy (*see* preceding chapter) or to surgical disease, with abscess of joint or bone. Exposure to cold and damp, in persons insufficiently fed, fatigued, or overworked, is the most common exciting cause.

**Symptoms.**—Rheumatic fever more often follows tonsillitis or other sore throat, and begins with fever and pains in the joints. The joints rapidly become very painful, hot, red, swollen, and tender; the large joints, as the knees, wrists, ankles, and elbows, being attacked in turn, the inflammation skipping from one joint to another. The muscles near the joints may also be somewhat swollen and tender. With the fever, which may be high (the temperature ranging from 102° to 104° F.), there are rapid pulse, copious sweating, and often the development of various rashes and minute blisters on the skin; there is also loss of appetite, and the bowels are constipated. The urine is usually very dark colored. Altogether, victims of the disease are truly pitiable, for they suffer agonizing pain, and are unable to move without increasing it. The weakness and prostra-



tion are marked. Anemia develops more markedly than in any other fever. Small, hard lumps, ranging from the size of a shot to that of a pea, sometimes appear on the skin of the fingers, hands, wrists, knees, and elbows. These are not tender; they last for weeks and months. They are seen more often in children, and are most characteristic of rheumatic fever, but do not appear until late in the disease.

Complications of rheumatic fever are many. In about one-half of the cases the heart becomes involved, and more or less permanent crippling of the heart persists later in life. Unconsciousness and convulsions may develop more often when the fever runs high.

Lung trouble and pleurisy are not infrequent. Chorea or St. Vitus's dance follows inflammatory rheumatism, in children, in some instances. Repeated attacks at intervals, varying from one to four and five years, are rather the rule—more particularly in young persons.

Acute rheumatism frequently takes a milder form, with slight fever (the temperature not over 100° to 101° F.) and slight pain and swelling of the joints. In children this is a common occurrence; the child keeps about, fever and other symptoms being so slight as to escape notice, except for vague, so-called "growing pains." But heart disease is apt to follow, and, therefore, any joint pain in a child should receive a physician's attention at the earliest moment. Recovery from rheumatic fever is the usual result, but with an increasing tendency to future attacks, and with the possibility of more or less permanent weakness of the heart—for acute rheumatism is the most common origin of chronic heart troubles.

The milder form often follows the more severe, and may persist for a long time. The duration of rheumatic fever is variable; in severe cases the patient is bedridden for about six weeks.

There are numerous other fevers in which inflammation of the joints may occur. Among these are included gonorrhea, pneumonia, scarlet fever, blood poisoning, diphtheria, etc. The joint trouble in these cases is caused by the special germ which occasions the original



disease, and the joint inflammation is not in any way connected with rheumatism.

Gout and acute deforming arthritis may mislead. The constant attention of a physician is emphatically demanded in every case of rheumatic fever, since the complications are so numerous, and since permanent damage of the heart may be prevented by proper care. Only frequent examinations of the heart will reveal the presence or absence of heart complications.

**Treatment.**—It appears extremely doubtful whether rheumatic fever can be cut short by any form of treatment. The disease is self-limited, that is, it will pass away of itself after a certain time.

The pain, however, can be rapidly abated by treatment. Warmth is of great value. It is best for the patient to sleep between blankets instead of sheets, and to wear flannel nightgowns, changing them as often as they become damp with sweat. To facilitate the changing, it is well to have the nightgowns slit all the way down the front, and also on the outside of the sleeves. Wrapping the joints in cotton batting and applying splints to secure absolute rest are great aids to comfort. The diet should be fluid, consisting of gruels, milk, broths, and soups. To relieve pain in the joints, cloths, wrung out of a saturated solution of Epsom salts or baking soda and very hot water, wrapped about the joint and covered with oiled silk, will be found extremely serviceable. Oil of wintergreen is another remedy which has proven of value when applied to the joints on cloths saturated with the oil and covered with cotton wool.

The bed must be smooth and soft, with good springs. High fever is reduced by the employment of cold to the head and by sponging the body with cool water at intervals of about two hours.

The two drugs of most value are some form of salicylic acid and an alkali. Sodium salicylate in solution in water should be given to the adult in doses of ten to fifteen grains every two hours until the pain is relieved, and then once in four hours, as long as the fever lasts. At the same time baking soda, one-half a level teaspoonful dissolved in water, should be administered every three hours, and this may be continued as long as the fever persists.

The patient must use a bedpan in relieving the bladder and

bowels, and should remain in bed for a great while if the heart is damaged. It is a disease which no layman should think of treating if it is possible to obtain the service of a medical man.

**Prevention.**—The surgical removal of enlarged or diseased tonsils, or teeth abscessed at their roots, is always advisable to prevent both rheumatic fever and chronic forms of so-called rheumatism. Experimentally it has been found possible to reproduce the heart and joint conditions present in rheumatic fever by injections of germs (streptococci) from diseased tonsils or teeth (*See* p. 609). Conversely, removal of diseased tonsils undoubtedly cures acute and chronic forms of what is commonly called rheumatism.

In the course of rheumatic fever it may even be advisable to cut out diseased tonsils.

The germs (streptococci) causing tonsillitis enter the blood of the patient and have a special predilection for the valves of the heart (producing valvular disease of the heart), the joints (causing rheumatism), and the nervous system (inducing St. Vitus' dance). These conditions are therefore practically one and the same disease—beginning with entrance and growth of streptococci in the tonsils.

### MUSCULAR RHEUMATISM

(*Myalgia*)

In this disease there is pain in the muscles, which may be constant but is more pronounced on movement.

Exposure to cold and wet, combined with muscular strain, frequently excite an attack. On the other hand, it often occurs during hot, dry, fine weather. Attacks last usually but a few days, but may be prolonged for weeks.

The pain may be dull, as if the muscle had been bruised, but is often very sharp and cramplike. There is commonly slight, if any, fever and no general disturbance of the health. The following are the most common varieties:

**LUMBAGO.**—Lumbago attacks the muscles in the "small of the back." It comes on often with great suddenness, as on stooping or lifting. It may be so severe that the body cannot be moved, and

the patient may fall in the street or may be unable to rise or turn in bed. In less severe cases the pain "catches" the patient when attempting to straighten up after stooping.

Pain in the back is often attributed by the laity to Bright's disease, but is not seen in the latter disorder, and is much more often due to sprain, flat feet or rheumatism. Pain caused by sprain of the back (sacro-iliac joint), which is so common, is frequently mistaken for rheumatism in the back, or lumbago, but there is usually a history of some fall, jar, or blow in the production of sprain, and it is located more precisely over the joint.

**STIFF NECK.**—This is a very common variety of muscular rheumatism, and is seen more especially in young persons; it may appear very suddenly, as on awakening.

It attacks the muscles of one side and back of the neck. The head is held stiffly to one side, and to turn the head the body must be turned also, as moving the neck causes severe pain. Sometimes the pain on moving the neck suddenly, or getting it into certain positions, is agonizing, but when it is held in other positions, a fair amount of comfort may be secured. There is a form of inflammation of the muscles of the back of the neck and head, in which small, hard, painful lumps are felt, and this condition is often associated with severe headaches and is relieved by massage.

**RHEUMATISM OF THE CHEST.**—In this form there is more or less constant pain, much increased by coughing, sneezing, and taking long breaths, or by movements. It usually attacks one side, more often the left. It may resemble neuralgia or pleurisy.

In neuralgia, the pain is more limited and comes as sharp, rapid, darting stabs of pain with intervals of freedom from suffering, and there are painful spots. The absence of fever in rheumatism of the chest will tend to distinguish it from pleurisy, in which there is more often cough. Examination of the chest by a physician, to determine the condition of the lungs, is the only method of making an exact diagnosis.

Muscular rheumatism also affects the muscles about the shoulder, shoulder blade, and upper part of the back; sometimes also the muscles of the belly and limbs.



**Treatment.**—Rest, heat, and rubbing are the most satisfactory remedies. In stiff neck chloroform liniment or analgesic ointment should be well rubbed into the affected parts several times daily. The patient should lie with the painful part on a hot water bag, or a thick, hot, flaxseed poultice may be applied to the neck and kept warm with a hot water bag. Lumbago is often immediately relieved by encircling the whole lower part of the trunk with strips of surgeon's adhesive plaster, as recommended in the forepart of this chapter for sprain of the back. Rest in bed with a hot water bag under the "small of the back" is also of service; or a piece of flannel may be laid on the back, over the plaster, and the flannel may be ironed with an ordinary hot flatiron. Two or three compound cathartic pills should also be taken, as a free movement of the bowels may cure the trouble.

In rheumatism of the chest strapping of the chest, as for broken rib, will be most successful—together with the application of a hot water bag while the patient is in bed. A patient with stiff neck, lumbago, or rheumatism of the chest, may be much benefited by taking a capsule hourly, containing ten grains of aspirin, followed each time by a whole glass of water. After taking five or six doses, or if ringing in the ears is produced, the drug should be discontinued for a time.

In addition to securing a free action of the bowels, in all cases of muscular rheumatism, it is well to encourage elimination from the kidneys by the drinking of one quart of lemonade daily in which two teaspoonfuls of cream of tartar is dissolved.

#### CHRONIC DEFORMING JOINT DISEASE

Our conception of chronic joint disease has been greatly changed by modern research. Formerly the terms rheumatic gout, rheumatoid arthritis, and chronic rheumatism, were used with the idea that they described distinct diseases. Now we realize that the term chronic rheumatism should be abolished because it has no meaning and is likely to lead the user of the term to employ the old valueless remedies for rheumatism. Acute rheumatic fever is the only form of rheumatism now recognized.



**Causes.**—Chronic joint disease is in almost all cases due to local inflammations in various parts of the body, and is caused by a variety of germs. These germs find their way into the blood, and in this fluid they invade the joints where they produce the changes seen in chronic inflammations of the joints. In chronic joint disease then, the patient needs the most careful study in order that the doctor may discover any local inflammation in any part of the body which may be the cause of the joint disorder.

While the cure of such existing local infections commonly results in improvement or recovery of the joint disease, in some instances such is not the case. It may be that chemical products sometimes explain the origin of chronic joint disease, and many cases are thought to be caused by the absorption of poisonous substances from the bowels in the condition known as enteroptosis, owing to retention of the intestinal contents.

The following conditions are now recognized as the most frequent causes of chronic joint disease:

(1) Chronically enlarged and diseased tonsils. These are most apt to occur in persons who have had acute tonsillitis. Removal of diseased tonsils should always be done in chronic joint disorder.

(2) Inflammation of the gums, with formation of "matter" or pus, followed by shrinking of the gums and loosening of the teeth (called Riggs' disease) and also abscesses so common at the roots of dead teeth, as shown by x-ray, may lead to chronic joint disease.

(3) Inflammation of the cavities connected with the nose (sinus disease) is another fruitful cause of chronic joint disease in which the specialist will be necessary for diagnosis and cure.

(4) It is thought that chronic inflammation of the gall-bladder and appendix may be a source of chronic joint disease, and these may be cured by surgery.

(5) Diseases of the urinary and sexual organs are frequent causes of chronic joint trouble: thus, abscess of the kidney, and inflammation of the bladder and urinary passages in both sexes, are included under this head. Chronic inflammation of the fallopian tubes in women and of the prostate and seminal vesicles in men, often due to gonorrhea, have been found causative factors. The local or sur-

gical treatment of these conditions will often cure or arrest the joint trouble. If the joint disease has progressed so that there are present deformities due to destruction or outgrowths of bone, the most favorable outcome that can be expected will be relief of pain and arrest of the diseased process.

**Symptoms.**—Occasionally the disease begins suddenly with fever and pain, swelling, heat, and tenderness in several joints. This appears at the beginning, like rheumatic fever, but the joints do not wholly recover and stiffness and swelling remain. If the joint forming the union of the lower jaw and skull is involved it is a fairly positive indication of this disease; the joints of the fingers and knuckles are also often swollen, tender, hot, and painful in this disease. More often the onset is gradual and without fever. The joints nearest the tips of the fingers, more often in women, show little hard knobs on the sides, and these joints are hot, painful and swollen at times. At first only one joint, as of the middle finger, may be attacked, and frequently the corresponding finger on the other hand is next affected. The joints of the fingers become enlarged, deformed, and stiffened.

The results of the disease are permanent, so far as deformity and the stiffness which causes interference with the movements of the fingers are concerned, but the disease may be arrested at any period of its development, leaving a serviceable, though deformed, hand. In these cases the larger joints are not usually involved.

In other cases the larger joints are involved. A joint will be painful, hot, and swollen. Creaking and grating are frequently heard during motion of the joint. The condition of the joint varies greatly, and improvement is marked at times. Other joints are attacked; gradually the joints become misshapen and deformed. The larger limbs are often bent and cannot be straightened, and the muscles waste away, making the joints look larger. The pain may be great and persistent, or slight. Numbness and tingling of the skin may trouble the patient, owing to inflammation of the nerves (neuritis), and the skin is sometimes smooth, glossy or freckled. In the worst cases the patients become absolutely crippled, helpless, and bedridden, and the joints immovable. Even though

most of the joints become useless, there is frequently sufficient suppleness in the fingers to allow of their use, as in writing and knitting.

In old men the disease is seen attacking one joint, as the hip or shoulder. The disease also affects the spine, more often the middle or below, so that there is great stiffness and pain in the back and down the legs. This is seen more commonly in men and is brought on in part by injury. The disease attacks children—more often girls—before the sixth year. Beginning often with fever and slight stiffness in one or two joints, the disease progressively attacks other joints. These later cannot be moved, and there is much swelling of the soft parts about them, as also wasting of the muscles. The glands are generally enlarged and there is sweating and pallor.

**Outlook.**—The majority of patients with deforming joint disease recover and have good health apart from the stiffness of their joints and the permanent deformity; those cases which start at the change of life in women are not so hopeful. The cases which begin with fever are the most favorable; some of the cases in children make a good recovery. Persons with disease of the spine rarely become wholly crippled and suffer from stiffness, and at times pain.

The pulse is often rapid in this disease, but true heart complications are rare. Dyspepsia is a frequent accompaniment.

**Treatment.**—Deforming joint disease is a chronic disorder in most cases, and requires the careful study and continuous care of the medical man. He may frequently arrest it in the earlier stages and prevent a life of pain and helplessness. The great hope is in the finding of a special inflammation in some part of the body, the relief of which may cure the joint trouble as well.

Nourishing food, as meat, cream, eggs and butter, is desirable. Various forms of baths are useful, especially the hot air bath or baking. The wearing of flannel is advisable and a warm climate is favorable so that the patient may be outdoors as much as possible. Mechanical measures are of great service, as the fixing of joints in splints, the plaster jacket in spinal trouble, and, later, the use of massage and movements of the joints. Medicines have little special value in directly curing the disease. Surgical treatment will sometimes overcome the crippling and deformities.

It is probable that all chronic joint disease (except gout) is due to infection, or some variety of germs, or bacteria. When the variety of infection or germ is known, as in the joint disease of gonorrhea and tuberculosis, these names are used as a prefix and the joint troubles are spoken of as gonorrheal or tuberculous joints.



## CHAPTER VII

### NERVOUS DISEASES

Neurasthenia. Hysteria. Insomnia. Headache.

#### NERVOUS EXHAUSTION—NERVOUS DEBILITY

(*Neurasthenia*)

Nervous exhaustion is by far the most frequent of the nervous diseases, especially in the United States, on which account it has been called the American Disease.

The condition was first described and named by Beard, of New York, in 1879. He defined it as a state in which there is a deficiency of nerve force, shown by undue sensitiveness (and reaction) to external impressions. Mental impressions are greatly exaggerated. What would be but a molehill to the robust, becomes magnified so that it appears as a mountain; a nervous strain, borne without trouble by the strong, results in nervous collapse; slight muscular effort occasions fatigue out of all proportion to the cause.

**Causes.**—No case is found, as a rule, to be due to any one cause. Usually several causes are responsible. Heredity plays an important part. Weakness and instability of the nervous apparatus—a neurotic temperament—is frequently inherited from parents, themselves the victims of nervous or mental troubles, or addicted to excesses of some kind. It may be due to faulty development and nutrition of the child while yet unborn.

Persons with neurotic temperament may be healthy if no continuous strain be sustained by them, but they have no reserve capital of nerve force, and easily succumb. Persons not born with weak nervous systems may acquire nervous exhaustion through mental and physical overwork, prolonged emotional excitement, care,

anxiety, or grief. Worry is both a cause and an effect of nervous prostration.

Certain occupations are more favorable to the development of the disease. Thus, teachers, brokers, bankers, journalists, business men, and women fretted by manifold household cares, are especially prone to nervous prostration. Poisons produce the condition, so that alcoholics and tobacco in some, morphin and the poisons of grippe, typhoid fever, and syphilis in others, are not infrequent causes. Sexual excesses, prolonged sexual excitement, and abuse of the sexual organs in the young occasion nervous debility, although the dread of the consequences is often a more potent factor than the damage done in the case of the latter misfortune. The strong emotional excitement induced by the longings, doubts, fears, and hopes of love and religion is also responsible for its share of neurasthenia. Diseases of special organs may so exhaust the nervous system as to cause general prostration.

A faulty sexual hygiene before or during married life is probably the most common cause of neurasthenia. When such can be cured, the nervous prostration is likewise relieved. Injuries to the head and back not at all uncommonly give rise to nervous exhaustion, even in the strongest persons. Trepidation over suits, or claims for damages, increases neurasthenia.

**Symptoms.**—Nervous exhaustion occurs more frequently between the ages of twenty and forty; both sexes are subject to it. Patients are usually of a spare figure, but occasionally are very stout.

The symptoms are more numerous and varied than in any other disorder known, while the actual alteration in the anatomy or structure of the nervous system, if any, is unknown.

Among the most frequent symptoms are: a feeling of pressure and fatigue in the top and back of the head; pain in the lower part of the spine and back of the neck; muscular weakness, as in walking; numbness, and creepy or crawling sensations in the skin; or feelings of heat or cold, imaginary feverishness, or general chilliness; and, again, burning, hot flashes, sweating, and flushing of the surface. A dragging, tired feeling in the eyes, or flashes of light, are among the most common complaints. Tender spots along the spine, usually

in more than one locality, and morbid introspection, or self-analysis of symptoms, are very common.

There is often despondency, confusion of the mind, and inability to fix attention, so that it becomes almost impossible for the patient to add a column of figures or dictate a letter. The emotions are under poor control, and patients may weep on the slightest cause. Thoughts which cannot be controlled may constantly run in the patient's mind. The temper is apt to be irritable or moody, and the subject forever is fearful and anxious about himself. He imagines he is becoming insane, is afraid to ride on the cars, to go among crowds, to be alone, fears tall buildings will fall on him, dreads fatal disease, thunder and lightning, etc. The sleep is variable; there is commonly sleeplessness, occasionally the opposite condition. The digestion usually suffers; the symptoms of special digestive diseases may be present (*See Nervous Dyspepsia*). Constipation is frequent.

Pain and distress in the region of the heart, and violent, rapid, and irregular heart action are frequent causes for complaint. Disorders of the sexual organs are the rule: in women, disordered menstruation and pain in the ovaries; in men, inability to perform the sexual act, or great exhaustion after it, or premature discharge from the sexual organ. Muscular weakness is shown at times, in severe cases, by unsteady, uncertain, and trembling gait; sometimes by difficulty in enunciating and in writing.

Pain may be felt anywhere—in the skin, head, neck, muscles, joints, or some internal organ. While all the symptoms enumerated never attack the same patient at any one time, they are apt to be more or less troublesome at different times, some being prominent in some persons, others in other individuals. Occasionally only one symptom is at all salient, and in that case the determination of the causes is difficult.

**Outlook.**—The outlook as to life is favorable: patients very rarely either die or have their lives shortened by nervous prostration. The disease has a tendency to be chronic and, even under most favorable circumstances, there may be relapses; in these cases the patient's courage and hope are sadly taxed.

The degree of cure depends upon the nature of the exciting causes, and whether these can be removed, e. g., upon the amount of inherited weakness; upon whether stress and strain may be removed; upon the duration of the disease before treatment is attempted; and also upon the ability and will to follow out treatment. The nervous capital will always be small, and, therefore, extra calls made upon it are liable to lead to bankruptcy.

Nervous debility which is not inherited, but acquired through some disease of special organs, may be entirely cured if the cause is removed. Cases due to accidental injury are often of grave import.

**Diagnosis.**—This is best made by a physician, after a thorough examination of the patient. In no disease is this more essential, since the symptoms are so varied and resemble those peculiar to so many other diseases.

One characteristic feature of nervous exhaustion is the very variety of symptoms, and their liability to change and shift. Another feature of importance is the tendency to improvement, when the surroundings and circumstances are favorable to happiness and well-being.

**Treatment.**—The first endeavor in any rational treatment is to remove the causes—whether they be unfavorable environment, circumstances, habits, injury, or disease.

Hereditary influences cannot be abolished, and treatment, as Osler remarks, should often have been begun a generation back; but neurotic tendencies in children can be overcome in large measure by proper training. Children should be brought up, as far as possible, out of doors, should receive simple, nourishing food, keep regular hours, and have plenty of sleep. Instruction calculated to prevent any sexual stimulation should be given, and if any signs of nervous disturbance develop at puberty, the child must be taken from school and be made to lead an outdoor life in the country. All emotional excitement should be avoided, as well as excess in alcohol, tobacco, tea, and coffee; if the latter can be absolutely cut off, it should be done. The nervous strain incident to long marriage engagements, to certain occupations, and to the various causes noted above, should be shunned whenever possible.



In no disease are the support and encouragement of a physician more helpful in allaying the morbid fear of the patient that he is suffering from a fatal or incurable disorder, in reënforcing the weakened will, and in restoring hope when relapses occur, than in neurasthenia.

The newer methods of psychotherapy are quite successful in some cases. The requisites for success are: (1) a physician of strong personality and ability; (2) the formation of a sanatorium or center in some attractive and healthful resort in which the general atmosphere will be conducive to recovery; and (3) the hopeful "suggestions" of the doctor and the faith in recovery which he imparts, together with the proper regulation of the patient's life, habits, and occupations.

In patients well enough to be about, one of the chief factors in promoting recovery is change of surroundings, habits, work, and amusements. In cases resulting simply from overwork, the rest attained by six months of travel and outdoor recreation will suffice—and this is the hackneyed advice. But when this is not possible, the hours of work may be shortened and an hour given to rest daily, while some form of exercise, as bicycling, riding, rowing, golf, fishing, hunting, tennis, swimming, or gymnastics, may at the same time be undertaken; the patient should choose that which appeals most strongly to his taste.

Total change in the habits—even to the extent of forming somewhat irregular habits, and to the pursuit of literary work in place of outdoor sports—has proved curative, but such an unusual course can be advised with safety only by a physician.

What would usually be called overeating is generally advisable, more especially in the thin and pale. A glass of milk, an egg nog, a cup of cocoa, a raw egg, or a cup of strained oatmeal should, one or the other, be taken between the regular meals and at bedtime. Sleeplessness should never be treated with drugs, unless by a physician's orders, as hypnotic drugs are usually unnecessary and injurious in these cases. A warm bath with a cold compress to the head, and a glass of warm milk or of beer, before retiring, are often sufficient.

Drugs, as a whole, play little part in the cure of nervous ex-

haustion, except to relieve certain symptoms. Cod-liver oil is frequently of value, while iron, in pallor and anemia, also supplies an essential constituent of the blood and is recommended. Indigestion improves more certainly under the general measures suggested, than by dieting, drug, or local treatment. (*See Nervous Dyspepsia.*)

Various forms of water cure are of worth. One of the most simple is the hot followed by the cold spray, which may be taken in the morning from a hose and sprinkler made for attachment to the ordinary bathroom faucet.

For the chronic cases, those too sick to follow the ordinary life, and for many weak, thin, and poorly nourished women, who can thus only escape from their manifold household worries, the "rest cure" originated by Weir Mitchell, of Philadelphia, is the most successful treatment. This implies the complete isolation of the patient in bed, usually in a well-ordered sanatorium, for six or eight weeks. The treatment comprises large amounts of nourishing food given at frequent intervals, with different forms of water cure, with massage and electricity; the patient gives up all responsibility to the doctor and nurse, and is shielded from emotion or cares and worries by separation from friends and family.

Gain in flesh in nervous exhaustion commonly goes hand in hand with general improvement. A gain of twenty to sixty, and even eighty, pounds sometimes results from the rest cure. Exercise in nervous exhaustion may be readily carried to excess. Exercise should never be followed by more than a healthy fatigue, and should be combined with a daily hour of rest on the bed or couch. Walking, or merely rest, in the open air is sometimes preferable to exercise for women.

The special disorders which we have noted as often leading to nervous exhaustion can, of course, be discovered and treated properly only by a physician, and the sooner patients suffering from symptoms suggestive of this disease submit to thorough examination, the better. No two cases are identical in symptoms, causation, or treatment required, but information concerning duration before treatment is very important in every case.

## HYSTERIA

Hysteria is a functional disease of the nervous system characterized by lack of self-control and increased impressionability, and manifested by the most varied symptoms: in fact there is scarcely any disease in medicine which hysteria may not simulate.

**Causes.**—Hysteria is seen chiefly in females, beginning more often after the age of twelve and occurring frequently in the childless or single, and during menstruation or the “change of life.” Repression of the sexual nature is thought by some to favor the disorder.

The chief causes are an inherited tendency to nervous disorders and improper training. Thus girls who are petted and spoiled are less able to withstand the buffets of the world, and desire for sympathy may tempt them to exaggerate their physical troubles or simulate disease.

The immediate cause of a hysterical attack is usually some emotional excitement, as an unhappy love affair, grief, worry, family troubles, or physical injury.

**Forms.**—There are two forms of hysteria: (1) the convulsive form, and (2) forms without convulsions.

(1) *The Hysterical Attack or Nerve Storm.*—This form usually arises from some emotional excitement. It generally begins with senseless laughing and crying, sighing, and a feeling as of a lump in the throat. This is followed by a choking sensation, palpitation of the heart, and difficulty in breathing, and then by a fit or convulsion.

The patient may fall and become apparently unconscious; she is not unconscious, however (as in epilepsy). The body becomes convulsed and the head and arms are thrown about in a violent and irregular manner. The hands are clenched with the thumbs turned in. Sometimes the body is perfectly rigid, the patient lying with the belly arched upward, the head thrown back, and the subject resting on the back of the head and heels. The eyes may be open and trembling of the eyelids is commonly seen.

The attack may continue for an interval of from ten minutes to



several hours, and will terminate in laughing, crying, sighing, and sometimes in a stupor.

This condition is apt to be mistaken for epilepsy in women. The points of difference are as follows: In hysteria there is some previous emotion, as a cause; in epilepsy no cause is apparent. The symptoms, as choking, lump in the throat, palpitation, laughing and crying, seen in the beginning of a hysterical attack, are lacking in epilepsy. In epilepsy the subject often bites her tongue; in hysteria the patient may bite her lips, hands, other persons or objects, but not her own tongue. In hysteria the patient may talk and scream during the attack, but never (except before the attack) in epilepsy. The attack in epilepsy rarely lasts more than three minutes; in hysteria not less than ten, and urination and movement of the bowels often happen in an epileptic seizure, but never in hysteria.

The graver forms of hysteria are rarely seen in this country or England, when, following an epileptic-like convulsion, the patient exhibits emotional excitement and catalepsy, in which the limbs are held in grotesque positions for an indefinite period. This may be succeeded by positions suggestive of the various passions, and by ecstasy, in which the subject has visions, hears voices, and converses with imaginary persons. Sometimes the patient ends by falling into a trance in which life appears to be almost extinguished—so feeble are the pulse and breathing.

(2) *The Hysterical State without Convulsions.*—The symptoms are so diverse and countless that a mere mention of some of the more common must suffice:

(a) *Spasms:* These include hiccough, difficult breathing or asthma, retention of urine, difficult swallowing, and false or phantom tumor of the abdomen—all caused by spasm of the muscles of these parts. Contractions of the muscles of the limbs causing deformities, and of the muscles of the jaw producing apparent lockjaw, are not rare. Rhythmical movements of the jaw, body, or limbs, and fine trembling of the hands, head, or leg may be seen. Complete paralysis of the legs, or of one side of the body, may occur.

(b) *Disturbance of Sensations.*—These are frequent in hysteria. Loss of sensation to touch, in one-half of the body or in spots,



agonizing pain in the top of the head (as if a nail were being driven in), painful spine with very tender spots along its course, and pain in the stomach and abdomen simulating that of organic disease, are observed. In relation to breathing, hysteria leads to gasping breathing, coughing, yawning, sighing, and rarely to cries like those produced by domestic animals. There are various recognized hysterical disturbances of the digestive organs, such as the lump in the throat, difficulty in swallowing, persistent loss of appetite, vomiting, distention of the belly, and extreme constipation or diarrhea. Violent beating of the heart, rapid pulse, flushing of the skin in various parts of the body, and pain about the heart, are often induced by hysteria. Chronic swelling, stiffness, and pain in the knee or hip may occur in hysteria and may be distinguished from organic disease with great difficulty. Fever is sometimes of hysterical origin.

Occasionally hysterical patients inflict wounds upon themselves and not infrequently seek surgical operations on slight pretext. The mind is always affected in hysteria, the memory is temporarily much impaired, and the will power is lessened or lost, so that the patient is a ready victim of suggestions, impressions, impulses, ideas, and misconceptions originating in the patient or in others. The desire for sympathy is paramount.

**Diagnosis.**—Certain symptoms are suggestive of hysteria apart from the manifestations which suggest other diseases—thus, the emotional temperament, attacks of weeping and laughing, the complaint of lump in the throat, gasping and sighing. There is usually a history of previous attacks.

**Treatment.**—Hysteria is a disease and not a perverse state of mind, as appears to be a not uncommon diagnosis. Harsh treatment is wholly improper. Proper training in self-control, the remedying of all physical ailments, and healthy occupation outdoors, are useful in preventing the disease.

The attacks themselves need little treatment, although a teaspoonful of tincture of valerian, or one-half teaspoonful of aromatic spirits of ammonia, in half a glass of water, are of service; also dashing cold water in the patient's face. Treatment by suggestion, in

which the patient is persuaded that the symptoms are of no importance and will disappear, is of great value when given by one in authority in whom the patient has implicit faith.

The rest treatment—in which the patient is treated away from home in a sanatorium, and is reëducated in all her habits and modes of life, and is under the care of a physician with marked personality, aided by good nursing, special diet, massage, electricity, and the water cure—is of the greatest benefit in severe cases.

Special symptoms must receive appropriate treatment. Hysterics naturally should not associate with each other. While the layman cannot expect to treat hysteria, he or she may do much to prevent it, especially by early training. Marriage may benefit mild cases. Successful treatment requires unusual tact, profound knowledge of human nature, strong sympathies (but dominance of the patient), and enormous optimism (Edwards).

### SLEEPLESSNESS

*(Insomnia—Wakefulness)*

Natural sleep is due to fatigue associated with a comparatively bloodless condition of the brain, and favored by the abolition of sources of excitement from the brain, such as noises, light, etc.

**Causes.**—The causes of sleeplessness are without number, as it is often merely a symptom of an unnatural state, and yet the only reasonable treatment consists in removing the cause in order to remedy the disorder.

Among the most frequent causes are: brain work associated with worry; noise; some sort of pain or irritation produced by indigestion; and a great variety of troubles, as nervousness, due to tea, coffee, or alcoholic drinking; nervous exhaustion; chronic constipation; eye strain; skin diseases; disorders of the brain; coughing; drug habits, as the use of opium and cocain; diseases of the heart and kidneys; and acute inflammations and injuries of all kinds. High altitudes and change in the hour for the principal meal, together with irregular times or places for sleeping, invite insomnia.

In infants, disorders of digestion, as colic, constipation, pain; too much sleep during the day or retiring too early; an over-hearty supper or hunger; excitement in play before bedtime; absence of sufficient fresh air by day or night; overwarm covering or room; noises; bright light; cold feet; or fatigue—all these are common factors in insomnia.

**Treatment.**—The cause should be corrected, if possible; it will often require a physician, however, to do this. Among the more simple remedies are the following: A hot foot bath or a warm (not hot) bath before bedtime, with a cold cloth on the head, will often procure sleep—particularly if there is heat of the head with a tendency toward flushing of the face. If the feet are cold and the head hot from mental work the use of a hot water bag at the feet is beneficial. The room should be cooler than by day ( $58^{\circ}$  to  $60^{\circ}$  F. or lower), except in the case of young infants and old persons; an exceedingly cold room favors sleeplessness, however. Some hot drink on retiring is often useful in aiding sleep, as hot milk with nutmeg grated or malted milk, hot soup, or hot toddy (for the aged), or a glass of beer.

When sleeplessness threatens, the mind must be diverted from the idea that one will not sleep. Reading a heavy or prosy book in bed (classics, as "Plutarch's Lives," etc.), or performing movements, such as deep breathing, or counting, are sometimes efficacious in diverting the mind from the haunting fear of insomnia. Wakefulness during the middle of the night may be combated by a glass of hot water or one of the other drinks mentioned.

Exercise out of doors, with avoidance of fatigue, and change in the activities from brain work to sports are frequently advantageous. Since insomnia is merely a symptom in many cases, e. g., of beginning nervous exhaustion, it behooves one to consult a physician if other symptoms occur.

Drugs should be the last resort, and are only permissible for a few nights to break up the wakeful habit. The greatest harm has been done by their habitual use, and they should be taken only under a physician's advice; but when this is not practicable, sodium bromid may be used with safety for a short period. Adults



may take fifteen grains two hours before retiring, and the dose should be repeated at bedtime, dissolving the drug in one-half glass of water.

No drug inducing sleep should ever be taken continuously, or more than once or twice a week. No form of opium is ever permissible for the relief of insomnia.

For children—besides removal of any discoverable cause—the warm bath at bedtime, or, if there is fever, wrapping the child in a sheet wrung out in cool water with a cold cloth on the head, and then in a warm blanket, will usually be sufficient. Whenever wakefulness results from pain of any severity, the usual remedies for sleeplessness fail completely.

### HEADACHE

It is unnecessary to describe headache. The chief object should be to discover and remove the cause.

**Causes.**—Among the more common causes are the following: eye strain; disease of the nose, throat, ear and teeth; indigestion and constipation; poisons; nervous debility; fatigue; anemia; menstruation; brain diseases; heat stroke; adolescence; cold; circulatory disturbances and migraine.

So much confidence was formerly placed in the location of pain in the head, as a means of diagnosis, that charts showing the sites of headache were hung on the walls of hospitals. The location of headache is often wholly misleading. The headache from eye strain may be either about the eyes, or in the back or top of the head, and the same applies to other headaches. Pain, however, in the nape of the neck or base of the skull, which may be more often a feeling of pressure, is quite characteristic of nervous prostration. In sick headache the pain is almost always on one side of the head.

The time of headache is of some importance. Headaches coming on regularly in the morning suggest disease of the nose or nasal cavities.

The kind of pain does not aid diagnosis. Neuralgic or darting pain may not be owing to nervous derangement but to a bad tooth, nasal disease, etc. Headache from disease of the womb and ovaries



is a tradition, but recent study seems to discredit such a cause. Frequent headaches, lasting even a lifetime and without discoverable cause, may be attributed to some unknown nervous derangement. We will now consider in detail some of the special causes of headache:

*Eye Strain.*—Eye strain is by far the most frequent cause of headache. There are no special symptoms, however, by which the patient or doctor can tell in any particular case that the headache is peculiar to eye strain. Eye strain commonly means astigmatism or muscle weakness.

While the pain may be located about the eyes and come on after special use of the eyes, it may be in any part of the head and arise without any apparent relation to the use of the eyes. The writer had a patient who suffered from severe headaches, on Sundays only, which were cured by wearing glasses. Inability to use the eyes long for close work, twitching and inflammation of the eyelids, frequent styes, and flow of tears, may suggest eye strain. Nausea and vomiting are often produced by eye strain. But in most cases we have no symptom but headache and, when this is frequent, the eyes should always be examined by a competent oculist—not by an optician.

*Disease of the Nose and Throat.*—Headache coming on regularly in the morning, especially about the forehead, should suggest nasal trouble. In persons who have had unusual discharge from or obstruction in the nose, this kind of headache is likely to occur. A discharge of thick secretion from one nostril at times is often characteristic. Severe headache, arising in persons with acute colds in the head or grippe, is likely to be due to inflammation and retention of secretion in some of the cavities in the forehead and face connected with the nose. This is called sinus disease. The headache may be constant and extreme and the patient very sick, perhaps with high fever and delirium. There is often much tenderness when pressure is made about the eyebrows and on either side of the root of the nose. The pain may be in the eyes, forehead, or other part of the head. Much confusion and many mistakes in diagnosis have been made in such cases and, when headache fol-

lowing cold in the head is persistent, it is always wise to seek the advice of a nose and throat specialist.

*Ear Disease.*—The pain usually begins in the ear, but the writer has seen a case in which pain from inflammation of the ear was referred wholly to a tooth. There may be fever, and tenderness on pressure behind the ear and in front of the external opening of the ear.

*Decayed Teeth.*—A diseased tooth may cause pain in the upper part of the face or temple so as to appear like neuralgic headache; there may even be no cavity visible and none of the teeth may be sensitive to jarring or pressure. The teeth should always be examined by a dentist in neuralgia about the face and head.

It will be noted how often headache is due to head troubles.

*Indigestion—Constipation—Biliousness.*—Headache is most frequent in that common form of indigestion (atony), where the food “lays in the stomach” and ferments. Another frequent cause is constipation masquerading under the name of biliousness. The patient can readily recognize headache from either of these causes by symptoms of indigestion, as nausea, coated tongue, bad taste in the mouth, belching of gas, feeling of weight and discomfort in the stomach and bowels, moving spots before the eyes, and mental depression. In constipation the effect of a quickly acting cathartic is often magical—as a bottle of magnesium citrate, or four tablespoonfuls of castor oil, or two or three compound pills may be taken at bedtime.

The meals should be light for several days and a diet may be allowed of cereals, crackers, toast, eggs, chops, chicken, white fish, a little baked potato, and buttermilk between meals, when the trouble points toward dyspepsia.

*Poisons.*—Many chemical substances circulating in the blood cause headache. The headache following alcoholic excess is most familiar. Excess in the use of tobacco, and possibly of tea and coffee, may excite headache and also irregular and violent action of the heart or palpitation.

Many drugs occasion headache as opium, lead, iron and nitroglycerin, quinin and salicylates which also cause noises in the ears.

The headache of indigestion, noted above, is supposed to be due to chemical poisons resulting from the fermentation and delay of food in the bowels. In the various fevers or infections headache is produced by the chemical poisons arising from the growth of the special causative germs.

Headache is especially prominent in typhoid fever, and in the eruptive diseases, as measles, scarlet fever, and smallpox; also in cold in the head, grippe, and tonsillitis. In these diseases it is not the sole, or even the chief, symptom. However, in typhoid fever, headache may be the most salient symptom at first with perhaps a feeling of weariness, cough, occasional nosebleed, and fever. The presence of headache and fever should always be a warning to seek medical advice.

Headache may be the main complaint in malarial fever. Headache and facial neuralgia are supposed to take the place of the chill and fever in malaria sometimes, and therefore to occur at a regular hour daily—every other day or every fourth day. Their connection with malaria is usually doubtful, in the absence of fever, but if headache is caused by malaria it will be cured by taking quinin.

The headache in Bright's disease of the kidney may be associated with swelling of the feet and ankles, shortness of breath, pallor, nausea, and vomiting; or headache may be the only symptom. Headache with dizziness and stupor may develop in diabetes, with the passage of large quantities of urine and the presence of thirst.

The escape of illuminating or coal gas into living rooms is a prolific cause for headache.

*Nervous Debility—Fatigue—Anemia.*—We have already noted that in nervous prostration headache is more often a feeling of pressure or constriction in the nape of the neck or back of the head. This sensation may also be general throughout the head, or in the top of the forehead, temples, or other part. It is doubtful if headache is common in anemia alone, but it is said to occur in that form in young women and to be relieved by lying down, which also benefits the headache of nervous prostration. Fatigue, hunger, and



overwork, especially in ill-ventilated rooms, are commonly recognized causes of headache.

*Menstruation.*—This is often preceded or followed by headache.

*Brain Diseases.*—In tumor or syphilis of the brain the headache is usually so violent as to prevent sleep, and there is often vomiting. In syphilis the pain occurs more often at night. The headache may be general, or on one side or part of the head. The constancy and severity of the headache, continuous for weeks, and the presence of slow pulse, paralysis of some part of the body, convulsions and stupor are characteristic of brain tumors. There may, however, be intervals of freedom from pain lasting weeks or months, in brain tumor. In meningitis there are similar symptoms, but the disease comes on rapidly, fever is marked, and the head is drawn back.

**Miscellaneous Causes.**—*Heat Stroke.*—Persons who have had heat stroke or who have only been exposed to excessive heat are liable to headache.

*Concussion of the Brain.*—A blow on the head with concussion of the brain will be followed by headache. The patient should stay in bed in a dark room with an icebag on the head.

*Adolescence.*—During adolescence, for some unknown reason, headache is common.

*Headache from Cold.*—There is a kind of severe persistent headache felt chiefly in the back of the head, neck and shoulders associated with sensitive lumps in the muscles of the back of the neck, just below the skull, while some are felt in the back of the skull itself and may be very tender. The condition is thought to be due to exposure to cold; it may be cured by massage.

*Circulatory Disturbances.*—In some persons changes in the caliber of the blood vessels caused by nervous derangement and shown by a red face and red blotches on the skin in various parts of the body, will produce headache.

### MIGRAINE

(*Sick Headache*)

This, in most instances, is a distinct form of nervous disease. It is a functional mental disorder, like epilepsy, and in ninety per



cent. of the cases is inherited. This does not mean that the parents have suffered from migraine necessarily, but from some nervous or mental disease.

Migraine is a peculiar, one-sided headache which takes the form of severe periodic attacks at more or less regular intervals. It may occur at a certain hour and often on a special day of each week, fortnight, or month, and often disappears at a certain hour. The disorder generally persists for years. Thirty per cent. of cases begin between the ages of five and ten; forty per cent. of cases before thirty. Therefore attacks of apparent sick headache which begin after thirty are probably some other disease.

When the disease arises in childhood it may cease at the beginning of adult life, but often continues to the age of forty-five to fifty in men, and the period of "change of life" in women. It is a little more frequent in women.

**Causes.**—The cause of migraine is unknown. When the tendency exists various other disorders may excite attacks. Among such conditions, which may bring on sick headaches, are: fatigue, eye strain, special articles of diet, indigestion, constipation, sexual abuse, alcoholic excess, diseases of the female sexual organs, and perhaps large tonsils and adenoids. Unlike most of the headaches described, due to some special cause, it is often impossible to cure migraine by the removal of the supposed causative conditions just mentioned—although it may sometimes be done.

**Symptoms.**—There may be some warning of the approach of a sick headache. The patient will feel unusually well the day previous, or there may, on the other hand, be mental depression and weariness; occasionally an aura or immediate warning is perceived for ten or fifteen minutes before the attack. Thus light or dark spots appear before the eyes, or there may be dizziness, buzzing in the ears, or blurring of sight. Then the pain begins in a spot about one eye, temple, or forehead, and may spread all over the side of the head, and rarely to the neck and arm. The chief feature consists in the headache being confined to one side of the head.

The headache is violent and boring and is aggravated by movement, noise, and light. The patient must lie down in a dark, quiet

room and is incapacitated for all duties. Nausea and vomiting appear toward the end of the attack: first bile and then food are brought up, hence they are sometimes called "bilious headaches."

Sick headaches last twelve hours, on the average, or from a few hours to three days in severe cases; the duration is about the same in any individual case. Relief is usually experienced at a certain hour after free vomiting, and often there is then a feeling of well-being and enormous appetite. Patients are well between attacks, unless they recur frequently. Very rarely does migraine become transformed into some severe form of organic nervous disorder.

**Diagnosis.**—"Sick headaches" beginning in childhood with a history of nervous inheritance are practically always migraine; those beginning after thirty should be viewed with suspicion and more often are secondary to some other disease. But migraine frequently does not follow the above description—the warnings are generally absent; there is simply one-sided headache and vomiting, or headache without vomiting, or even attacks of vomiting without headache. If diseases were typical doctors would be superfluous and one could use a book instead.

**Treatment.**—Any article of food provoking an attack should naturally be avoided. The writer has a patient in whom cocoanut in any form invariably precipitates an attack. All the conditions mentioned as known causes should be removed if possible—not being able to dispel the hereditary cause, we are often unsuccessful in cure.

At the first warning a tablet of nitroglycerin, containing one-hundredth of a grain, may ward off an attack; it may be repeated once or twice, at fifteen minute intervals if it affords relief. A quickly acting cathartic, as a bottle of magnesium citrate, or a tablespoonful of Epsom salts in a whole glass of water, is beneficial at the beginning of the attack. The patient should lie down in a quiet, dark room, with an icebag or cold cloth on his head and hot water bottle at his feet, while mustard paste (flour, four parts—mustard, one part), between two pieces of old cotton cloth, should be applied to the back of the neck and over the stomach. Menthol cologne or a menthol pencil applied to the forehead, or the drinking of hot strong tea with lemon juice, may be of service. Fluidextract of cannabis

indica may be taken in two drop doses every half hour until relief is obtained—not using over ten doses.

To permanently prevent the return of the disease one of two drugs is employed: strontium bromid in ten grain doses three times daily after meals in one-half glass of water, or one-quarter of a grain of extract of cannabis indica three times daily in pills, after eating. Either must be taken for weeks or months.

## CHAPTER VIII

### NERVOUS DISEASES (*Continued*)

Hiccough. Facial paralysis. Neuralgia. Sciatica. Convulsions in children. Epilepsy. Delirium tremens. Chronic alcoholism or steady drinking.

#### HICCOUGH

The noise produced in hiccough is caused by sudden sucking in of air into the throat, by means of violent and repeated contractions of the diaphragm—the great muscular partition at the bottom of the chest, separating it from the organs in the abdomen. While this curious disorder usually lasts but a short time it sometimes persists for days or weeks and becomes an alarming and occasionally a fatal malady.

**Causes.**—Frequently there is no apparent cause, as it appears in persons in seemingly perfect health. Irritation of the mouth and throat caused by hot drinks, pepper, a strong pipe, etc., are frequent sources of the trouble.

Indigestion is another common cause, particularly in children. Excitement and some nervous diseases (particularly epilepsy, hysteria and shock) induce it. In various inflammations of abdominal organs and in typhoid fever it is common; also in gout, diabetes, and in kidney disease.

**Treatment.**—Among the more simple and effective remedies are holding ice in the mouth or drinking cold water, dragging out the tongue, and tickling the nose with a straw until one sneezes several times. Holding the breath or taking deep breaths, and taking locally stimulating drinks, as a teaspoonful of straight brandy or whisky, or a teaspoonful of salt in lemon juice, will sometimes arrest hiccough. A most effectual remedy consists of stopping up both ears



with the tip of one finger of each hand while one drinks from a cup held by another person.

Swallowing a little Jamaica ginger in water will sometimes afford relief. Washing out the stomach or the use of an emetic or cathartic, or both, are of benefit if there is indigestion. The application of a tight binder about the chest with the head held forward may check the trouble, or the use of mustard and flour poultice to the neck and pit of the stomach. In the cases which resist these simple measures, it will be necessary to procure medical aid. A teaspoonful of compound spirit of ether, or one-half teaspoonful of spirit of camphor, in a little ice water, will often prove successful, and may be repeated every hour, for three doses if necessary. In severe cases a doctor will have to inject morphin freely.

#### FACIAL PARALYSIS

**Causes.**—This is a common disorder, frequently due to exposure to cold, as, for example, from cold air blowing on one side of the face in driving or while sleeping near an open window. Disease of the ear is a cause, especially in children; also injuries about the ear and tumors in this region; and syphilis is also a cause. One theory is that facial paralysis may be due to a microörganism setting up an inflammation of the facial nerve.

Among the less common causes which do not concern us so much here (as they require medical skill for their determination) are diseases of the brain in which other parts of the body may also be paralyzed, and in which the general health may be disturbed in many ways.

**Symptoms.**—The patient may have a cold in the nose or throat, or both, owing to the same exposure which produces the facial paralysis; however this is not always the case. The paralysis comes on rapidly, usually with little pain, although there may be earache. The patient may discover it on looking in a mirror, or on trying to eat, talk, or whistle.

The face is smooth and expressionless on the paralyzed side; the eye cannot be closed on that side and weeps; the mouth is drawn over to the well side, and saliva may flow from it. Whistling becomes

impossible; eating is interfered with, and the food collects in the cheek of the paralyzed side. When the patient attempts to laugh, the paralysis becomes very noticeable, for the face is wrinkled on the sound side, but motionless on the paralyzed side. Speech is somewhat difficult. Wrinkles disappear from the forehead on the paralyzed side, and cannot be made to appear at will. The lower eyelid and corner of the mouth droop on the paralyzed side.

There may be a peculiar taste at first, and later there may be some loss of taste in the tongue. There may be some swelling of the face on the paralyzed side in the beginning of the trouble. Deafness sometimes accompanies facial paralysis, and is commonly a sign of existing ear disease.

The facial paralysis following exposure to cold usually disappears with complete recovery in from two to six weeks. Persons have been known to have several attacks.

**Treatment.**—Hot applications should be made about the ear for the first few days. If there is running from the ear, or earache, an aurist should be consulted. The most valuable measures aiding recovery are electricity and massage, which must be managed by a physician. Some cases may run on for six or eight months, and then eventually recover. In other patients a certain amount of alteration in the facial expression may permanently persist.

### NEURALGIA

Neuralgia means pain in a nerve or nerves. Theoretically there is no change of structure in the nerve in neuralgia, but practically it is occasionally impossible for even a physician to distinguish inflammation of a nerve (or neuritis) from neuralgia.

**Causes.**—Neuralgia occurs more frequently in those inheriting a weak nervous system, in the overworked and underslept, the anxious, nervous, excitable person. It is rare in childhood, and many varieties, as facial neuralgia, are more common in women, while sciatica attacks men more frequently.

A "run-down" condition favors the disease, especially when combined with poor blood. Exposure to cold, bad teeth, overindulgence in alcohol and in tobacco, rheumatism, gout, kidney disease, diabetes,

and lead poisoning are among the exciting causes. It is more apt to attack women during pregnancy and the "change of life."

**Symptoms.**—Neuralgia may begin suddenly. More often there are some peculiar feelings, as a sensation of cold or prickling, before the pain commences. The pain is of a sharp, darting, shooting, stabbing, or burning nature, with intervals of a second or a few minutes when the patient is free from suffering.

It occurs more often on one side of the face or chest. The skin over the painful region is rarely swollen, and hot or cold, but almost invariably it is very tender. When pain attacks the eye tears may flow; when the pain is referred to the teeth saliva may flow freely. Neuralgia about the head rarely leads to falling or whitening of the hair. Twitching or spasms of the muscles in the painful area may be present. Painful spots along the course of the nerve which gives rise to the pain are a peculiar feature of neuralgia.

Attacks of neuralgia may subside without treatment in time, but are likely to last from one to several hours, and to return at regular or irregular intervals of long or short duration.

**Diagnosis.**—Neuralgia sometimes attacks the back of the head and neck, or the shoulder and upper arm, when the pain resembles that of rheumatism or of an injury to the shoulder.

Neuralgic pains of one side of the chest are not rare. They are much aggravated by motion, deep breathing, or coughing. They may resemble the pains of pleurisy, but there is usually no fever or cough; still, examination of the chest by a physician is essential to rule out the latter disease. Neuralgia in the left side of the chest, in the region of the heart, is common in women and is frequently the cause of much anxiety on account of supposed heart disease. Unless other symptoms of heart disease are present, or unless there is fever, such pain is much more apt to be neuralgia and is not serious.

Pain in the chest resembling neuralgia may be produced by many other conditions, and, therefore, a careful medical examination is always desirable. Neuralgia of the chest is seen more often in thin, nervous women. In this affection tender spots may be discovered near the spine and breastbone, and midway between these points.



Neuralgia of the spine, with tender spots along its course, and pain in the neck, or in the middle or small part of the back, is often present in nervous women, and in those suffering from railway accident. Pain in the very lowest end of the spine, which is aggravated by the sitting position, is also common in women. Occasionally persons suffer from neuralgia in the heel and sole of the foot.

**Complications.**—An eruption on the skin, known as shingles, may be associated with neuralgias of the chest. After a few hours or days, or even a longer period, a red, tender spot appears, and upon this a group of small blisters occurs. When the eruption disappears the pain usually subsides, but may continue indefinitely, and there is great tenderness of touch. Shingles may be seen on the head, forehead, face, upper arms, shoulder, buttock, and thigh, accompanied with severe pain. It usually attacks only one side of the body.

The eruption should be well dusted over with powdered boric acid, being careful not to break the blisters. Then gauze, covered well with boric acid, should be laid on the eruption and held in place by a bandage about the chest. When the eruption is very painful zinc ointment, containing twenty grains of menthol to the ounce, may be spread on the eruption and covered with sterile gauze and bandage.

**Treatment of Neuralgia in General.**—Prevention is better than cure. Wholesome, nourishing food, exercise out of doors, change of air and scene, cold baths, and sea bathing are valuable in preventing neuralgia in susceptible persons. The same measures will be found valuable in the treatment of neuralgia, with the possible exception of cold baths.

Such remedies as the analgesic ointment in tubes (*baume analgésique*), menthol pencil, or chloroform and alcohol—each one ounce—in which sixty grains of menthol are dissolved may be applied externally and covered with oil silk. Heat in the form of a hot water bag or poultice is often of great benefit. A two grain quinin pill may be taken hourly during the attack.

Exposure to cold, mental excitement, and movement aggravate the pain. Pain is a vague and uncertain symptom, and may be felt in a spot distant from the real source of disease, so that it is



not safe for a layman to call his pain neuralgia until he has received a proper medical examination. There are many other remedies which can only be employed by the physician, including electricity, drugs, and surgical measures, and the neuralgic patient should seek his services at the earliest moment.

### FACIAL NEURALGIA

#### (*Tic douloureux*)

This is the most common form in women. The pain may be felt in the forehead, eye, and nose, on one side of the face, with a spot of tenderness just above the eye. The eye is often bloodshot and the tears flow, or the pain is felt between the eye and mouth, with spots of tenderness on the side of the nose, below the eye, and along the line of the gum of the upper jaw on one side of the face. Frequently the pain attacks the temple, ear, lower jaw, teeth, and tongue, with a tender spot in front of the ear; there is increased pain in chewing and speaking, and saliva runs from the mouth. Neuralgia of the face occasionally causes severe pain, and continues obstinately for a long period, especially in those with inherited tendencies and in the elderly.

### SCIATICA

Sciatica is a neuralgia or inflammation of the sciatic nerve which extends from the upper middle part of the back of the thigh down to the foot.

**Causes.**—It is occasioned by exposure to cold or wet, by lifting, and in women, may be due to some disease in the neighborhood of the womb or to injury sustained in childbirth. It may also be due to disease of the spine. Rheumatism is a common cause.

**Symptoms.**—It may come on suddenly, or gradually, beginning with pain in the small part of the back. The true pain of sciatica starts in the middle of the upper fleshy part of the back of the thigh, and extends down the middle of the back of the limb, even to the foot; there are tender spots along this course, especially in the upper and middle portion of the back of the thigh.

The pain is generally intense—worse at night and on walking.

It is burning or boring in character, but at the beginning may be felt only after exercise, or when the leg is held in certain positions. Walking becomes difficult (or impossible), even if the weight is borne on the toes with the knee bent. There are sometimes cramps, spasms, and wasting of the muscles in the disabled limb. The patient usually is compelled to remain in bed, and the disease may last months, with occasional improvement and return of the trouble.

Sciatica is frequently mistaken for sprain of the back which is quickly relieved by strapping with surgeon's adhesive plaster. A thorough examination by a medical man is demanded to eliminate local disease, as of the spine or hip, and, in women, of special troubles which may occasion the sciatica.

**Treatment.**—Rest in bed with the application of hot water bags to the back of the thigh may be employed; wrapping the limb in cotton batting and bandaging are of service. A blister, cut one and one-half inches square, may be applied for a few minutes over the seat of the pain at the upper part of the back of the thigh, or iodine may be painted on the same spot over a surface as large as a silver dollar until the skin is almost black, and either of these may insure relief in mild cases, if used at the very beginning of the trouble. A host of remedies is at the command of the physician, and a patient is unfortunate, indeed, who cannot procure medical aid to relieve his suffering, though many cases are very intractable.

#### CONVULSIONS IN CHILDREN

**Symptoms.**—Convulsions may begin with squinting of the eyes, restlessness, starting or crying out in sleep, grinding the teeth, bending the thumbs, or slight twitching of the muscles of the face or limbs. Such signs should serve as a warning, particularly if the child is feverish, and should lead one to bathe the patient immediately with cool water as described below.

The fit may begin with a cry or choking sound: the body stiffens and is arched forward, while the head and neck are bent rigidly backward; the belly may be arched upward so that the child rests on the back of his head and on his heels. The eyes are fixed, staring, squinting or rolled up, but sightless; the child neither sees, feels,

nor hears—he is wholly unconscious. The face becomes blue, the hands are clenched, and then the body and limbs begin to jerk and twitch, the arms and legs being alternately bent and straightened. The breathing is rapid and noisy, there is grinding of the teeth and frothing at the mouth; sometimes the tongue is bitten.

The whole attack may last but a moment, and there may be no more, or the attack may last for several minutes, or, rarely, hours, or there may frequently be repeated attacks. If the immediate cause, as fever, can at once be removed, there is little probability of a return of the fits. The child, after the convulsions, acts bewildered and begins to cry; he returns to consciousness, or falls to sleep or into a stupor, or, very rarely, dies in the fit.

**Treatment.**—The child should be placed in a bath a little warmer than blood heat ( $105^{\circ}$  F.), but not hot, with a cold cloth on his head, and kept under water to the neck for ten minutes. Then he should be removed and wrapped warmly in blankets. Great damage has frequently been done to children by exposing them unduly, or burning them by water which is too hot, in the excitement of the moment. When a warm bath is not obtainable one should dip a towel into a quart of warm water (in which is stirred a tablespoonful of mustard), wring it out, and wrap it about the child's body, which is then covered with blankets and allowed to remain ten or fifteen minutes in this pack.

When the child is conscious and can swallow, a teaspoonful of syrup of ipecac should be given to empty the stomach. Just as soon as the child is removed from the bath, an injection of warm soapsuds, to move the bowels, is advisable. Immediately afterward about one tablespoonful of thin boiled starch and water containing from three to five grains of chloral (or, if the child is over two years of age, five to ten grains of chloral) should be injected into the bowel. The child should be made to retain it by holding a towel over the outlet of the bowel. It is wise also to open the bowels by giving one grain of calomel (or two grains, if over one year of age), dropped on the tongue, or mixed with a little sugar and water in a teaspoon.

If the child has fever (the temperature should always be taken if possible), the treatment is different from the above. He should



not be given the warm bath, but a cold cloth should be continually on the head, and the entire naked body sponged frequently with cool, not cold, water (70° F.), rubbing the skin dry covering the patient lightly, and placing a hot water bottle at the feet. It is well to use the bowel injection and chloral in fever cases, but not the emetic.

The milk should be largely diluted with water, if the patient is a bottle-fed baby, for some time after the attack. The condition which has caused the convulsion should be investigated by a physician, and removed if possible. Children of school age should be kept away from school indefinitely after a convulsive seizure.

**Causes.**—Children born of nervously weak or alcoholic parents, or infants weakened by rickets or some exhausting disease, as diarrhea, are more liable to spasms—especially under the age of two.

Among the more common immediate causes of convulsions are: indigestion, teething, the onset of fevers of any kind (where the chills in an adult are often replaced in children by convulsions), as grippe, measles, scarlet fever, pneumonia, malaria, tonsillitis, diphtheria, and chickenpox. In these bacterial diseases it is the poison produced by the germs which irritates the brain rather than the mere increase of temperature in the fever. Raisins or orange peel swallowed by young children have not infrequently caused convulsions.

Among the less frequent causes are: worms, earache, heart disease, whooping-cough, disease of the brain or spinal cord, severe and prolonged diarrhea, fright, anger, foreign bodies in nose or ear, pain, constipation, tight foreskin, and hot weather.

Spasms occurring soon after a difficult childbirth, especially when instruments were used, indicate a probability that injury of the brain is the cause, and the result is uncertain.

When spasms appear first as twitching of certain muscles, and increase in gravity and frequency as time goes on—particularly if the child is backward, awkward, or has a head of unusual size or shape—there is a likelihood of epilepsy (*See* below).

**Outlook.**—Infants, figuratively speaking, are bundles of sensitive nerves and centers, as yet unused to resist slight sources of irritation, so that in conditions when adults have chills, fever, or delirium,



babies have convulsions. These, as we have seen, however, are rarely fatal in themselves, although terrifying to the anxious onlooker. Indigestible food, as bananas and corned beef, may cause the most severe attacks in young babies.

Convulsions occurring in children with high fever do not usually return when the fever is reduced, so that when teething and indigestion are at the bottom of the attack, the measures recommended will usually prevent a return of the trouble. It is only when convulsions are frequent and persistent that the outlook becomes serious and the danger of epilepsy or other organic disease of the brain threatens. Removal of the cause will generally effect a permanent cure of convulsions.

### EPILEPSY

**Diagnosis.**—The only apparent difference between epilepsy and accidental or occasional convulsions in children is one of duration. The attacks are similar—one cannot distinguish between them—but in epilepsy the fits are repeated and the condition is chronic.

**Forms.**—There are two kinds of epilepsy we need note—a severe form with insensibility and spasms; a milder form with transient loss of consciousness without spasms.

**Symptoms of the Severe Form.**—There are three stages in the attack:

(1) The patient may turn around rapidly, or even run swiftly; more often a terrible cry or low gurgling groan is emitted, and the patient falls to the ground unconscious. The body is stiff and arched upward, with the head thrown back or to one side, or the body is bent sidewise. The face is pale at first, but quickly becomes dark or bluish, the jaws are rigidly set, the legs are outstretched, but the arms are bent at the elbow with the fingers tightly clenched in the palms. This is the rigid stage, and lasts but fifteen to thirty seconds.

(2) This is the convulsive stage. The spasms begin; the limbs are jerked violently; the face is contorted and working. The eyes are wide open and rolling, the pupils dilated, and the whites showing. The jaw may be firmly set and the tongue or lips bitten, or the mouth may be open with the lips flapping loosely in breathing, and the mouth covered with froth which may be bloody. Sometimes

the urine escapes, and less often the contents of the bowels. The fit rarely lasts more than one to three minutes.

(3) The patient gradually becomes relaxed and quiet, and may recover after a variable time. Sometimes he comes to himself very soon in a dazed and bewildered state at first, and suffers from a dull headache; at other times the patient remains unconscious, with red face and noisy breathing—in a stupor, from which he may be aroused after a time, or may not awake, if left alone, for hours. No memory of the fit is retained.

More often the attacks recur every two or three weeks. Sometimes they happen as often as a hundred times in one day, and occasionally only once in a year or two. They begin more commonly in youth. Following an attack a patient may do violent acts of which he is unconscious, he may have pains in muscles, exhaustion, paralysis, or difficulty of speech, or remain in a dull, despondent, or trancelike state; sometimes he feels particularly well. In severe and fatal cases, the fits occur in rapid succession without any intervals of consciousness. Both sexes are equally liable to epilepsy.

The severe attacks of epilepsy often give warning of their coming. Thus, for a few seconds before a fit, a person may have peculiar sensations, as a tickling or tingling of the hand, or pressure in the region of the stomach, or strange feeling over the heart, which seems to rise and envelop the head. In others, there may be flashes of light, odd noises or voices, peculiar odors or tastes, or a feeling of terror or strangeness preceding the attack. In the majority there is, however, no distinct warning or “aura,” as it is called.

Attacks may occur at any time of day or night and, if at night, they may pass unnoticed for years, although if the bed is wet with urine and there is any injury to the tongue on waking, there is a strong probability that a fit occurred during the night. Hysterical attacks in girls or young women are often mistaken for epilepsy.

**Symptoms of Epilepsy without Spasms** (*Petit mal*).—In this form of epilepsy there is momentary unconsciousness, but the patient does not have spasms. Sometimes it is a mere interruption in his occupation. He becomes suddenly pale, the eyes are fixed, and he stops talking, eating, playing the piano or cards, or dressing, only

to continue in a few moments where he left off. He may be walking when attacked and continue mechanically, and come to himself, finding that he has been unconscious. A glass or spoon or other object which he may have been holding at the time, usually falls from the hand.

There may be some confusion in speaking or dizziness after the attack, or the patient may perform some common act unknowingly, such as to partially undress, or even to do acts of violence. There are many varieties of this milder kind of epilepsy, but it usually ends in the severe form with fits, as described above.

Fainting is most likely to be confused with the mild form of epilepsy, but in fainting the patient usually falls and the pulse is feeble or imperceptible, while in this variety of epilepsy the patient does not generally fall and there is a history of similar attacks and the pulse is not much affected. In some cases patients do fall unconscious in *petit mal*, but do not have convulsions.

**Treatment.**—During the fit one should loosen the clothing about the neck and body, see that the patient is kept lying down and not injuring himself, and also prevent his tongue from being bitten by holding a piece of rubber, a fold of towel, or cork, between the teeth. If a small body like a rubber stopper, an ink eraser, or a cork be used, a string must be tied to it for safety. This is usually all that is required unless the fit is longer than usual, when the physician may find it necessary to resort to powerful remedies best administered by himself.

The general treatment consists in abstinence from meat and from salt, in an outdoor life, and in the use of bromids. In children education and discipline should not, however, be relaxed unless convulsions are frequent and severe, when treatment in a home for epileptics is advisable.

Sodium bromid may be given to advantage, until a physician's advice be procured, stopping it for a time if such symptoms as constant drowsiness, coated tongue, or pain in the stomach and bowels develop. Sixty grains daily is an average dose for an adult, and it should be given diluted with two glasses of water (better soda water or Vichy), in a single dose, four to six hours before the expected



time of attack. Laxatives must be freely used, such as rhubarb and soda.

Each case must be carefully studied by a physician, as it may be possible to discover some cause and remove it and so cure the disease, and the treatment should only be pursued under such guidance. Irritation in any part of the body may be such a cause. Thus, the correction of astigmatism or strain of the eye muscles; operation or local treatment of obstructions and catarrh in the nose, adenoids, and tonsils; the extraction of decayed teeth; the expulsion of worms; the cure of digestive disorders, constipation, or diarrhea; circumcision for a tight foreskin; and the remedying of local troubles in any part of the body may lead to an arrest of epilepsy. Marriage of an epileptic should be absolutely forbidden.

Localized spasms or convulsions of the face, one arm or leg, without unconsciousness (jacksonian epilepsy), frequently result from injuries, inflammation (meningitis), and tumors of the brain. The spasm may at first be limited to a single group of muscles, as of the jaw, toes, and thumb, and slowly extend to the whole face or limb. A large proportion of these cases is cured by operations on the head, but such are not usually advisable in ordinary epilepsy.

**Causes.**—Epilepsy begins commonly in youth. It is not infrequent for a child to have convulsions between the ages of four and six, and for epilepsy to appear in about the tenth year. It often begins in females at the menstrual period, and occurs thereafter more frequently at these times. Heredity is the commonest cause; about one-third of the cases show nervous disease—not usually epilepsy—in the parents, such as neuralgia, hysteria, insanity, or “nervousness” in some form, but most of all, alcoholism. Disease of the lungs in the parents seems to be a predisposing factor.

Among the more immediate causes of convulsions besides those mentioned above are: steady drinking, exhaustion or poor state of the blood (anemia), injury, fevers, fright, and indigestible food, some diseases of the sexual organs, and any local cause of irritation.

**Outlook.**—Epilepsy is usually chronic, and may continue permanently; life is apt to be shortened thereby. In early life the prospects of recovery are much brighter, but the outlook is poorer in



long-continued attacks and in grown persons. Epilepsy, beginning after thirty, is apt to be merely a symptom of brain disease (syphilis) and offers hope of cure. There is little probability of death in the fit, unless through the patient's accidentally falling into fire or water, or suffering injury in the fall, and occasionally being smothered from lying on the face, as when attacks occur in bed.

Epileptic subjects are often peculiar, irritable, and excitable, or dull, and may become mentally deficient in time. There are many marked exceptions to this rule, and some of the strongest characters in all history have been epileptics, viz.: Mahomet, St. Paul, Peter the Great, Napoleon, and Julius Cæsar. Some cases are entirely cured, and the greatest benefit has been obtained in colonies for epileptics which have been established in some of our United States.

#### DELIRIUM TREMENS

(*"The Horrors"*)

Delirium tremens does not occur in those given to occasional sprees of drinking, even if prolonged, but in the habitual heavy drinkers (on the average, after a period of eight years), and is brought on by an unusual excess in drinking, failure of digestion, or by some nervous shock, as happens when the person suffers from bodily injury, as a broken leg, or an acute disease (in seventy per cent. of cases) especially pneumonia and erysipelas.

**Symptoms.**—The attack begins with sleeplessness, depression, and restlessness for a day or two, and then the patient experiences a mental change. He talks continually in a rambling, disconnected manner, and is in constant motion, wanting to go out to attend to this or that matter, and is commonly filled with fear on account of objects which he imagines he sees—such as rats, snakes, and monsters, all of which drive him into such a state of terror that he is continually desiring to escape, and may try to jump out of the window or attempt suicide. There are generally some fever, a weak and rapid pulse, muscular weakness, and trembling of the hands and tongue; the skin is flushed and covered with sweat.

After three or four days the patient will secure a good sleep, which

is usually the favorable turning point of the disorder, when rapid improvement follows. In fatal cases the ravings, sleeplessness, and restlessness persist, while the prostration and weakness of the pulse increase until the patient dies of heart failure. As many as seventeen attacks have occurred in one person.

Recovery is the rule in uncomplicated attacks, but the average death rate is fifteen to twenty per cent. and when the subject is weak or old, or the delirium is complicated with an acute disease, as pneumonia, the mortality is very high.

**Treatment.**—The patient must be watched every minute, confined to a room, and better, to bed. The room should be darkened. The patient should be secured by fastening the wrists and ankles to the side of the bed, while a sheet, folded eighteen inches wide, is passed over the body and made fast to the sides of the bed. In addition it may be necessary to use a sheet which is passed across the patient's back while the ends are brought upward through the armpits and fastened to the head of the bed.

The essentials in treatment are elimination by cathartics, drinking of fluids, bathing, stimulation by drugs, good feeding, and cold applications. The old idea of overdosing the patient with drugs to make him sleep is now considered bad treatment, as the disease is usually self-limited to five days, when recovery can be expected in uncomplicated cases. To begin with the subject should be given four compound cathartic pills; or five grains of calomel followed in six hours by a bottle of magnesium citrate. Then the drinking, during the first day, of three quarts of hot water or iced Vichy or soda water should be encouraged, or weak lemonade in which is dissolved a teaspoonful of cream of tartar to the quart. Whisky may be given to the amount of a tablespoonful in a glass of soda water every two hours for the first twenty-four hours, but after this it should be stopped and no form of alcohol should be allowed.

For the first twelve hours no food should be taken by the patient, but after this he should be fed every two hours with one of the following: a glass of buttermilk, or rich milk diluted with an equal amount of soda water, Vichy or Apollinaris water, a glass of hot tea or coffee with a great deal of cream, egg nog, or strong broth well

seasoned. In addition, ten drops of tincture of *nux vomica* should be given in a glass of water every three hours.

For procuring sleep nothing is better than the use of cold water externally. The patient should lie naked on a blanket over a rubber sheet. He should have cold water dashed on him by means of a large sponge and be rubbed over with a coarse towel until warm and dry, and then the same process should be repeated once or twice and the patient put to bed with a hot water bag at his feet. This treatment, with a glass of hot milk, will usually produce sleep, and may be carried out once or twice daily, even with the complication of pneumonia. If sleep cannot be thus obtained a dose of one teaspoonful of paraldehyd, in two tablespoonfuls of whisky in water, may be given and repeated in one or two hours if necessary.

Sleep cannot readily be procured until the end of the third or fourth day and it is well not to begin to employ drugs for this purpose until that time or until there are signs of exhaustion. Many drugs, as bromids, chloral, morphin, and hyoscin, are used by doctors, but leading authorities believe that while cases, deprived of alcohol and sleeping drugs, may prove more violent, the attack is shorter and recovery quicker without them.

A physician's services are always desirable, particularly to discover and treat any underlying and complicating condition, as pneumonia, broken rib, or other injury, to judge whether the patient's general condition warrants the use of such powerful remedies as are sometimes required, and to manage the mental aspect of the case.

### CHRONIC ALCOHOLISM

#### *(Steady Drinking)*

The steady drinker tends to lay on fat; his intellect becomes less acute, and he is irritable, depressed, anxious, restless, forgetful, and dull, especially in the morning. He becomes careless about his person and habits, and often lies unintentionally. The judgment may become defective, and the mind is sometimes weak. Many exceptions occur in heavy, habitual drinkers who preserve a high degree of mental ability for some years.



Epilepsy is sometimes a result. Chronic catarrhal inflammation of the stomach is one of the commonest effects of alcoholism, shown by a coated tongue, bad breath, and sinking feeling in the stomach, in the morning, and nausea or vomiting. The small veins on the face enlarge, producing a characteristic appearance—namely, the red nose and cheeks. There is trembling of the hands, lips, and tongue and the eyes are watery. Inflammation of the nerves, especially in the legs, gives rise to pains, numbness, and, frequently, loss of strength. The heart and blood vessels become diseased. The vessels become brittle and are apt to break, occasioning apoplexy. Disease of the kidneys often accompanies the change in the blood vessels and heart. The liver is frequently attacked, and enlargement followed by fatal contraction results.

Consumption is much more common in alcoholic persons. The children of alcoholic parents are more prone to suffer from various nervous diseases, such as neurasthenia, hysteria, chorea, epilepsy, insanity, idiocy, and also from rheumatism and gout. Occasional excess in drinking is much less apt to produce permanent injury than habitual immoderate drinking.

Individuals differ enormously in their tolerance to alcohol. The periodic drinkers possess little will power and are started on a drinking bout by slight provocation; they tend to become steady drinkers similar to those just described. Dipsomaniacs are periodic drinkers, but in reality insane.

The attacks are sudden and irresistible. They may last a day or two, or weeks, and there may be complete loss of memory during the seizure.

**Treatment.**—After an attack of ordinary drunkenness with loss of appetite, nausea, constipation, headache, restlessness, remorse, mental depression, and weakness, the patient may take a teaspoonful of aromatic spirits of ammonia (in which is placed a little red pepper), in cracked ice and water every hour. If there is much vomiting, a teaspoonful of syrup of ipecac, followed by several glasses of water, will serve to wash out the stomach and aid recovery. When the vomiting has stopped the patient should take three compound cathartic pills.



The treatment of chronic alcoholism should be done in accordance with a patient's desire—forcible detention and treatment will not accomplish much. It is better to care for the patient in a hospital or sanatorium and not in his home. Alcohol should be gradually withdrawn, giving two to four tablespoonfuls of whisky in milk the first day, only half of this amount the second, and none the third day. In the young and strong, alcohol may be stopped at once.

The diet should consist of a glass of milk, buttermilk, egg nog, broth, cereal, gruel, or tea or coffee with considerable cream, every two hours.

In the beginning free purging is essential. Four or five compound cathartic pills are to be taken at one dose. The older methods consisted in the use of proper diet, rest in bed, applications of water in various forms to the body, in baths, sprays, and packs, together with massage and exercise—all requiring several months. In this country Lambert's treatment is now chiefly in favor, in which by the use of free purging, by the production of sleep, the giving of his special mixture, and stimulation with strychnin, the craving is removed within a few days and the patient may be "cured" in a week or more. If the patient ever drinks again the craving will, however, return and he should be under a doctor's supervision for some months, making a weekly visit to his office; any special disorders produced by drink should be treated. Unless the surroundings are favorable to recovery, after the patient returns to his home, the cure will not be permanent.

## CHAPTER IX

### ACUTE AND CHRONIC BRIGHT'S DISEASE OF THE KIDNEYS

#### BRIGHT'S DISEASE OF THE KIDNEYS

Bright's disease of the kidneys is acute or chronic, and its presence can be definitely determined only by physical examination of the patient together with chemical and microscopical examination of the urine. Acute Bright's disease coming on in persons previously well, may, however, present certain symptoms by which its existence may be suspected even by the layman.

#### ACUTE BRIGHT'S DISEASE

##### *(Acute Inflammation of the Kidneys)*

**Causes.**—Acute Bright's disease is often the result of exposure to cold and wet. Inflammation of the kidneys may be produced by swallowing turpentine, many of the cheap flavoring extracts in large amounts, carbolic acid, and Spanish flies; the external use of large quantities of turpentine, carbolic acid, or Spanish flies may also lead to acute inflammation of the kidneys. It occurs not infrequently in pregnant women.

The contagious germ diseases are very frequently the source of acute Bright's disease, which is then either a complication or a sequel. Thus scarlet fever is the most frequent cause, but measles, smallpox, chicken pox, yellow fever, typhoid fever, erysipelas, diphtheria, cholera, and malaria are also causative factors. Acute Bright's disease may be secondary to acute tonsillitis, blood poisoning, surgery of the kidneys, syphilis, tuberculosis, and severe burns and injuries.

**Symptoms.**—Acute Bright's disease may develop suddenly with pallor and puffiness of the face, owing to dropsy. The eyelids, ankles, legs, and lower part of the belly are apt to show signs of the dropsy most. There may be nausea, vomiting, pain, and lameness in the small part of the back, chills and fever, loss of appetite, and often constipation. In children convulsions sometimes appear. The urine is small in amount, perhaps not more than a cupful in twenty-four hours, instead of the normal daily excretion of three pints. Occasionally complete suppression of the urine occurs. It is high-colored, either smoky or of a porter-color, or sometimes a dark or even bright red, from the pressure of blood.

Stupor and unconsciousness may supervene in severe cases. Recovery usually occurs in favorable cases, within a few weeks, with gradually diminishing dropsy and increasing secretion of urine, or the disease may end in a chronic disorder of the kidneys. If acute Bright's disease is caused by, or complicated with, other diseases, the probable result becomes much more difficult to predict.

**Treatment.**—The failure of the kidneys to perform their usual function of eliminating waste matter from the blood makes it necessary for the skin and bowels to do double duty. The patient should be kept very warm in bed, with flannel night clothes and blankets next to the body.

If possible, the diet should consist wholly of milk and water, alternating a glass of each every hour during the day; when milk cannot be taken readily thin gruels made with milk may be used. Or a small amount of Apollinaris water, lime water, tea, or coffee can be added to milk to make it more palatable. Imperial drink, made by adding a teaspoonful of cream of tartar, the juice of half a lemon and sugar to a pint of boiling water, should be taken daily, in two doses (in place of two glasses of pure water), to increase the secretion of urine and aid the action of the bowels. Salt must not be given to patients at all as it favors dropsy. As the patient improves, bread and butter, green and juicy vegetables, and fruits may be permitted.

The bowels should be kept loose from the outset by salts given in as little water as possible, and immediately followed by a glass

of pure water. A teaspoonful may be given hourly until the bowels move. Epsom or Glauber's salts are efficient, but the compound jalap powder is the best purgative. Children, or those to whom these remedies are repugnant, may take the solution of citrate of magnesia, of which the dose is one-half to a whole bottle for adults.

The skin may be stimulated by the patient's lying in a hot bath for twenty minutes each day, or, if this is not possible, by wrapping the patient in a blanket wrung out of hot water and covered by a dry blanket and then by a rubber or waterproof sheet, and he should be allowed to remain in it for an hour with a cold cloth to the head. If the patient takes the hot bath he should immediately be wrapped in warm blankets on leaving it, and should receive a hot drink of lemonade to stimulate sweating.

Vomiting is allayed by swallowing cracked ice in Apollinaris water, single doses of bismuth subnitrate (one-quarter teaspoonful) once in three hours, and by heat applied externally over the stomach. Recovery is hastened by avoiding cold and damp, and persisting with a liquid diet for a considerable length of time.

A course of iron is usually desirable after a few weeks have elapsed to improve the quality of the blood. The following is the dose: for adults, ten drops of the tincture of the chlorid of iron taken in water through a glass tube; for children, five to ten drops of the syrup of the iodid of iron. In either case the medicine should be taken three times daily after meals.

#### CHRONIC BRIGHT'S DISEASE

This includes several forms of kidney disease. The symptoms are often very obscure, and the condition may not be discovered or suspected by the physician until an examination of the urine, blood pressure, or heart is made. It should therefore emphasize the importance of regular, yearly, complete, physical examinations of every individual. This advice is particularly important for persons who have reached middle age.

Accidental discovery of Bright's disease during examination for life insurance is not rare. The disease may exist for years without



giving rise to sufficient trouble to cause the patient to seek the advice of a doctor.

**Causes.**—Chronic Bright's disease often follows, and is the result of fevers, malaria, infections, and acute inflammation of the kidneys. It is more common in adults, and is often hereditary. Overeating, more especially of meat, and overdrinking of alcohol, are sometimes causes. Gout and syphilis are common factors in its causation, also the strenuous life with "high living." The immediate cause of the more common form of chronic Bright's disease is at present unknown.

It is not a disease of the kidneys alone, but the blood vessels become thickened and narrowed, and the heart is enlarged to force the blood through the partially choked blood vessels and the diseased kidneys. Ultimately the end comes through failure of the kidneys to function or, more often, through rupture of the blood vessels (apoplexy) or failure of the overworked heart, and resulting dropsy.

**Symptoms.**—The symptoms are most diverse and varied, and it is not possible to be sure of the existence of the disease without a careful physical examination, together with a complete analysis of the urine (collected for twenty-four hours), both made by a competent physician. Patients may be afflicted with the disease for long periods without any symptoms, until some sudden complication calls attention to the underlying trouble.

Symptoms suggesting chronic Bright's disease are among the following: loss of strength and energy, rising several times at night to pass water, sleeplessness, furred tongue, indigestion, diarrhea and vomiting, frequent headache, shortness of breath, paleness, puffiness of the eyelids, swelling of the feet in the morning, dropsy, failure of eyesight, nosebleed and, at times, apoplexy. As the disease comes on slowly, the patient usually has time to apply for medical aid, and attention is called to the foregoing symptoms (only a few of which are commonly present in one individual) merely to emphasize the importance of attending to such in due season.

**Outlook.**—While the outlook as to complete recovery is very discouraging, in many cases persons may live and be able to work for years in comparative comfort. When a physician pronounces

the verdict of chronic Bright's disease, it is not by any means equivalent to a death warrant, but the condition is often compatible with years (ten to fifteen or more) of usefulness and freedom from serious suffering.

**Treatment.**—Medicines will not cure Bright's disease, and in the earlier stages they are not desirable. The essentials of treatment include a quiet life free from care, worry, and excitement, with a moderate diet consisting chiefly of vegetables (except onions, radishes, and dried peas and beans), bread, all cereals, and fats—as butter, cream, bacon, and salad oil. Fish, shellfish, eggs, and meat should be eaten sparingly. One of these may be taken once daily, but in very moderate amount. A pint of cream and six to eight glasses of water should be taken daily, or enough to cause the passage of three pints to two quarts of urine in the twenty-four hours.

The underclothing should be of wool the year round. A warm bath ought to be taken daily, with vigorous friction to excite the action of the skin, and it is important to always keep warm. When possible the patient should spend the winter in a warm, dry climate. Moderate daily walking is advisable. Biweekly sweats, taken with hot air cabinets sold by druggists, are often of great value, but their use should be endorsed by a physician. The bowels should be kept active by a small dose of mineral water or Epsom salts (in a glass of water) on arising. Tea or coffee allowable once a day.

Medicines have their usefulness to relieve special conditions, but are only to be taken upon the advice of a physician, whose services should always be secured when available.

## CHAPTER X

### GENITO-URINARY DISEASES

Gonorrhea in men and women. Syphilis. Prevention of gonorrhea and syphilis. Cystitis. Enlarged prostate. Bed-wetting in children.

#### GONORRHEA

##### GONORRHEA IN MEN

**Causes.**—Gonorrhea is a contagious inflammation of the urethra accompanied by a white or yellowish discharge. It is caused by a specific germ, the gonococcus, and is acquired through sexual intercourse with a person suffering from this disease. The disease is said to occur in from seventy-five to ninety per cent. of all males, and is more common in cities. Exceptionally the disease may be conveyed by objects soiled with the discharge, as basins, towels, and, in children, diapers, so that in institutions for infants it may be thus transferred from one to the other, causing an epidemic.

The mucous membrane of the lower part of the bowel and the eyes are also subject to the disease through contamination with the discharge.

**Symptoms.**—The disease begins usually three to seven days after sexual intercourse, with symptoms of burning, smarting, stinging, tickling, itching, and then pain on urination, and a watery discharge from the passage, soon followed by a yellowish or white secretion. Frequent urination is also a common symptom.

The disease, if uncomplicated and running a favorable course, may end in recovery within six weeks or earlier, with proper treatment. On the other hand, complications are exceedingly frequent, and the disorder often terminates in a chronic inflammation which may persist for years—even without the knowledge of the patient—and may

result in the infection of others after all visible signs have ceased to appear.

**Treatment.**—If possible consult a physician at once. Rest is the most important requisite; it is best taken in bed, otherwise the patient should keep as quiet as possible for several days.

The diet should consist of large quantities of water or milk, or milk and Apollinaris or Vichy, with bread, cereals, potatoes, and vegetables—absolutely avoiding alcohol in any form. Sexual intercourse is harmful at any stage in the disease and will communicate the infection. Aperient salts should be taken to keep the bowels loose. The parts affected should be soaked in warm water three times daily to reduce inflammation and for cleanliness. All cloths, cotton, etc., which have become soiled with the discharge, should be burned, and the hands should be washed after contact with the discharge; otherwise the contagion may be conveyed to the eyes—producing blindness. It is advisable for the patient to take one-half teaspoonful of baking soda in water three times daily between meals for the first four or five days, or better fifteen grains of potassium citrate and fifteen drops of sweet spirit of niter in the same way. After all swelling and pain have subsided, local treatment may be begun.

Injections or irrigations with various medicated fluids constitute the best and most efficient measures of local treatment. In case a physician cannot be obtained the injection of argyrol twice a day, as advised under prevention, is the best local remedy. No greater mistake can be made than to resort to the advertising quack, the druggist's clerk, or the prescription furnished by an obliging friend. Skillful treatment, resulting in a complete radical cure, may save much suffering from avoidable complications and months or years of chronic trouble.

At the same time the first medicines advised are to be stopped, and oleoresin of cubebs, five grains, or copaiba balsam, ten grains—or both together—are to be taken in capsules, three times daily after meals, for several weeks, unless they disturb the digestion too much. A suspensory bandage should be worn throughout the continuance of the disease.

The approach of the cure of the disease is marked by a diminution



in the quantity and a change in the character of the discharge, which becomes thinner and less purulent and reduced to merely a drop in the passage in the early morning; but this may continue for a great while.

Chronic discharges of this kind and the complications cannot be treated properly by the patient, but require skilled medical care. In this connection it may be said that most patients have an idea that the subsidence or disappearance of the discharge is an evidence of the cure of the disease. Experience shows that the disease may lapse into a latent or chronic form and remain quiescent, without visible symptoms, during a long period, but susceptible of being revived under the influence of alcoholic drinks or sexual intercourse. It is important that treatment should be continued until all disease germs are destroyed, which can only be determined by the examination of the secretions from the urethra, under the microscope.

**Complications.**—The more common complications of gonorrhea are inflammation of the glands in the groin (bubo), acute inflammation of the prostate gland and bladder, of the seminal vesicles, or of the testicles. The latter complication is a most common cause of sterility in men.

Formerly it was thought that gonorrhea was a local inflammation confined to the urinary canal and neighboring parts, but advances in our knowledge have shown that the germs may be taken up into the general circulation and may affect any part of the body, such as the muscles, joints, heart, lungs, liver, spleen, kidneys, etc., with results often serious and sometimes fatal to life.

One of the most common complications is gonorrheal arthritis, which may attack one or several joints and result in stiffness or complete loss of movement of the affected joint, with more or less deformity and permanent disability. Another complication is gonorrheal inflammation of the eye, from direct transference of the pus by the fingers or otherwise, and resulting in partial or complete blindness.

#### GONORRHEA IN WOMEN

**Causes.**—Gonorrhea in women is a much more frequent and serious disease than was formerly supposed. The general impression

among the laity is that gonorrhea in women is limited to the prostitute and vicious classes who indulge in licentious relations. Unfortunately, this is not the case.

There is perhaps more gonorrhea, in the aggregate, among virtuous and respectable wives than among professional prostitutes, and the explanation follows: A large proportion of men contract the disease at or before the marrying age. The great majority are not cured, and the disease simply lapses into a latent form. Many of them marry, believing themselves cured, and ignorant of the fact that they are bearers of contagion. They transmit the disease to the women they marry, many of whom, from motives of modesty and an unwillingness to undergo an examination, do not consult a physician, and they remain ignorant of the existence of the disease until their health is seriously impaired.

**Symptoms.**—In women, gonorrhea is not so acute and painful as in men, unless it involves the urethra. It usually begins with smarting and painful urination, with frequent desire to urinate and with a more or less abundant discharge from the front passage.

In the majority of cases the infection takes place in the deeper parts, that is, in the neck of the womb. In this location it may not at first give rise to painful symptoms, and the patient often attributes the increased discharge to an aggravation of leukorrhea from which she may have suffered. The special danger to women from gonorrhea is that the inflammation is apt to be aggravated during the menstrual period and the germs of the disease ascend to the cavity of the womb, the tubes, and ovaries, and invade the peritoneal covering, and cause peritonitis. Pregnancy and childbirth afford favorable opportunities for the upward ascension of the germs to the peritoneal cavity.

The changes caused by gonorrheal inflammation in the maternal organs are the most common cause of sterility in women. It is estimated that about fifty per cent. of all sterility in women proceeds from this cause. In addition to its effects upon the child-bearing function, the danger to the health of such women is always serious. In the large proportion of cases they are made permanent invalids, no longer able to walk freely, but compelled to pass their lives in a

reclining position until worn out by suffering, which can only be relieved by the surgical removal of their maternal organs. It is estimated that from fifty to sixty per cent. of all operations performed on the maternal organs of women are due to disease caused by gonorrheal inflammation.

**Treatment.**—Rest in bed, the use of injections of hot water medicated with various drugs, by means of a fountain syringe in the front passage three times daily, and the same internal remedies recommended for men, with hot sitz baths, will usually relieve the distress.

In view of the serious character of this affection in women and its unfortunate results when not properly treated, it is important that they should have the benefit of prompt and skillful treatment by a physician; otherwise the health and life of the patient may be seriously compromised.

The social danger of gonorrhea introduced after marriage is not limited to the health of the woman. When a woman thus infected bears a child the contagion of the disease may be conveyed to the eyes of the child in the process of birth. Gonorrheal pus is the most virulent of all poisons. A single drop of the pus transferred to the eye may destroy this organ in from twenty-four to forty-eight hours. It is estimated that from seventy-five to eighty per cent. of all babies blinded at birth have suffered from this cause, while from twenty to thirty per cent. of blindness from all causes is due to gonorrhea.

While the horrors of this disease in the new-born have been mitigated by the Credé method (dropping of two per cent. nitrate of silver solution in the eye immediately after birth), gonorrhea still remains one of the most common factors in the causation of blindness, when there is neglect to use this method. Another social danger is caused by the pus being conveyed to the congenital parts of female children, either at birth or later by some object upon which it has been accidentally deposited, such as clothes, sponges, diapers, etc.

The disease occurring in children is exceedingly difficult of cure and is often followed by impairment in the development of their maternal organs. Much of the ill health of young girls from disordered



menstruation and other uterine diseases may be traced to this cause. Another serious infection in babies and young children is gonorrheal inflammation of the joints, with more or less permanent crippling.

### SYPHILIS

*(The Pox—Lues)*

Syphilis is a contagious germ disease affecting the entire system. While commonly acquired through sexual intercourse with a person affected with the disorder, it may be communicated from a mother to her infant while in the womb before birth. Syphilis is thus acquired by the child before birth from the mother and not from the father—except indirectly as he infected the mother.

It is authoritatively stated that 13 per cent. of persons acquire syphilis and 1,650,000 are affected annually in this country (Edwards). This is borne out by the testing of large numbers of persons promiscuously in which the Wassermann test in some regions has shown one positive reaction in eight individuals. Syphilis and tuberculosis are the two great destroyers of health and happiness, but syphilis is the more common.

**Symptoms.**—Acquired syphilis may be divided into three stages: the primary, secondary, and the tertiary.

The first stage is characterized by the appearance of a pimple or sore on the surface of the sexual organ, not usually earlier than two, nor later than five to seven weeks, after sexual intercourse. The appearance of this first sore is subject to such variations that it is not always possible for even the most skillful physician to determine the presence of syphilis, by physical examination, until the symptoms characteristic of the second stage develop. A raw sore with hard deposit beneath, as of a coin under the skin, follows the pimple on the surface. It may be so slight as to pass unnoticed, or become a large ulcer, and may last from a few weeks to several months. There are several other kinds of sores which have no connection with syphilis and yet may resemble the syphilitic sore so closely that it becomes impossible to distinguish between them. So that formerly the rule was to wait until the later symptoms devel-



oped before a positive diagnosis was made; then it was too late to cure the disease at once. Now a specimen from the sore should always be examined microscopically for the presence of the germ of syphilis. If found, the patient may be cured at once and for all time by immediate treatment with salvarsan and mercury. Along with this sore, lumps usually occur in both groins, due to enlarged glands.

The second stage appears in six to seven weeks after the initial sore, and is characterized by the occurrence of a copper-colored rash over the body, but not often on the face, which resembles measles considerably. Sometimes a pimply or scaly eruption is seen following this, or in place of the red rash. At about, or preceding, this period, other symptoms may develop, as fever, headache, nausea, loss of appetite, and sleeplessness; but these may not be prominent. Moist patches may appear on the skin, in the armpits, between the toes, and about the rectum; or warty outgrowths in the latter region. There is sore throat, with frequently grayish patches on the inside of the cheeks, lips, and tongue. The hair falls out in patches, or less often is all lost. Inflammation of the eye is sometimes a symptom. These symptoms do not always occur at the same time, and some may be absent or less noticeable than others.

The third stage comes on after months or years, or in those subjected to treatment it may not occur at all. This stage is characterized by sores and ulcerations on the skin and deeper tissues, and the occurrence of disease of different organs of the body, including the muscles, bones, nervous system, and blood vessels; every internal organ is susceptible to syphilitic change.

A great many affections of the internal organs—the heart, lungs, kidneys, brain, and cord,—which were formerly attributed to other causes, are now recognized to be the result of syphilis. The central nervous system is peculiarly susceptible to the action of syphilis, and, when affected, may show it by paralysis and disabling and disfiguring disorders. Such nervous disorders often occur years after a cure of syphilis has apparently resulted.

Thus locomotor ataxia is syphilis of the spinal cord, and paresis or “softening of the brain” is syphilis of the brain. Formerly it was thought that these diseases might result from other causes than

syphilis, or that they were the result of the poison of syphilis after the germ had disappeared. Now we know that syphilis in any form is not cured while any of the germs are alive in the body, and that locomotor ataxia and paresis are the direct results of the action of the syphilitic germ on the nervous system.

**Outlook.**—Children born with syphilis of syphilitic parents show evidence of the disease at birth or usually within one or two months. They present a gaunt wasted appearance, suffer continually from snuffles or nasal catarrh, have sores and cracks about the lips, loss of hair, and troublesome skin eruptions. The syphilitic child has been described as “a little old man with a cold in his head.”

The internal organs are almost invariably diseased and the infant mortality is about 75 per cent. Of those that survive birth 95 per cent. of syphilitic children die if untreated, but only 10 per cent. if properly treated (Etienne); while only 3 per cent. perish if the parents are treated during pregnancy (Fournier). But those who live to grow up may be puny and poorly developed and are prone to be delicate.

**Causes.**—It is to be noted that syphilis is not necessarily a venereal disease that is acquired through sexual relations. It may be communicated by kissing, by accidental contact with a sore on the patient's body, or by the use of pipes, drinking or eating utensils, or by contact with any object soiled with the virus of the disease. The secretions as nasal mucus, saliva, sweat, urine, and excrement of patients are not contagious unless they contain some blood in which the germs live.

Any mucous membrane or abraded part of the skin may become inoculated with the virus of syphilis, followed by a sore similar to that described as appearing on the private parts, and later by the development of general symptoms. The contagiousness of the disease is supposed to last during the first three years of its existence, but there are many authentic cases of contagion communicated by persons in the fourth and fifth year of the disease.

**Diagnosis.**—The positive determination of the existence of syphilis at the earliest moment is of the utmost importance in order to set doubt at rest, and so that treatment may be begun. It has hereto-

fore been necessary to wait until the appearance of all of the characteristic symptoms—as the eruption, sore throat, enlargement of the glands, falling of the hair, etc.,—before it was considered safe to be positive. In later cases when the symptoms were doubtful one had to experiment with treatment in order to diagnose a case. The recently discovered Wassermann reaction is reliable after six weeks from the time of beginning syphilitic infection and at any later date, as long as syphilitic germs remain in the body. No test is more valuable (except microscopic examination of a specimen from the first sore, *see* above), because it has been impossible otherwise to diagnose a large proportion of syphilitic patients.

Many persons are unaware of having the disease when it is present, and some have acquired it other than by the usual method. The Wassermann test is probably accurate in 80 to 90 per cent. of cases of syphilis with manifestations (Osler). Treatment will cause the test to become negative but if the patient is not permanently cured by the destruction of the syphilitic parasites, the test will again prove positive.

**Treatment.**—Treatment should be begun as soon as the diagnosis is made, and must be continued continuously or intermittently for two or three years. If treatment is instituted before the secondary symptoms it may prevent their appearance so the patient may remain in doubt whether he has the disease or not—unless there has been a positive Wassermann test or microscopic examination of a specimen from the sore.

The most skilled specialist cannot always distinguish the disease before the eruption appears, because other sores on the sexual organs may closely simulate syphilis.

The treatment has hitherto been conducted first with mercury and then with a mixture of mercury and iodid of potash. Very considerable knowledge and skill are required in adopting these to the individual needs and the peculiarities of the patients, so that it would be an impossibility to satisfactorily describe their use to a layman. Erlich's great discovery of salvarsan ("606") was thought to supply a remedy which would cure syphilis for all time by the use of one injection. This has been found not to be true except



in unusual cases, but it often is true if the remedy is given soon after the first appearance of the primary sore. Nevertheless, the remedy kills immensely larger numbers of the syphilis parasite at one dose than does mercury, which takes weeks or months of daily use to accomplish what is done by salvarsan in one injection. Three to five doses of salvarsan are commonly injected into a vein, one week apart, as soon as a diagnosis is made, and after this mercury is given by injection or rubbing on the skin and, following this, by the mouth for a period of two or more years.

The earliest date at which marriage is permissible, following thorough treatment, is two full years after the beginning of the disease, and at least one year after all symptoms have disappeared (Osler) (*See* below). If these conditions have been complied with, there is little danger of men communicating the disease to their wives and by that manner to their offspring. Abstinence from alcohol, tobacco, dissipation, and special care of the teeth, are necessary during treatment.

**Outlook.**—The majority of syphilitics recover wholly under treatment and neither have a return of the disease nor do they communicate it to their wives or children. There are, however, cases on record, in which a man has communicated the disease five or six years after apparent recovery, and one can never promise that there will never be a return of the disease. By taking the Wassermann test at three or six month intervals one would now be warned of the return of the disease.

Without proper treatment, or without treatment for the proper time, recurrence of the disease is frequent, with the presence of destructive and serious conditions characteristic of the third stage of syphilis.

By return of the disease is meant a return of symptoms of syphilis. If all the syphilitic germs have been killed the disease can never come back. But very often the patient is apparently perfectly recovered and cannot transmit the disease to others (absence of germs in his blood), and his blood test (Wassermann) is negative. But the germs may live deeply buried in the tissues and, after a period of five, ten, fifteen, or even twenty years, such sequelae as paresis



or locomotor ataxia (or a host of other syphilitic conditions) may develop. While syphilis is not so fatal to life as tuberculosis, it is the cause of more unhappiness and suffering.

Abortion is one of its most common manifestations in syphilitic women. Abortion or premature birth occurred in 40 per cent. of 330 syphilitic pregnancies, according to Edwards. Syphilis is wholly preventable while, at present, tuberculosis is not. It is not probable that syphilis is ever transmitted to the third generation, but deformities, general debility, small and poor teeth, thin and scanty growth of hair, nervous disorders and a generally miserable physique are seen in children whose parents were the victims of inherited syphilis.

*Syphilis Not Truly Inherited.*—In married life syphilis may be communicated to the wife directly from a primary sore on the genitals of the husband during sexual intercourse, but contamination of the wife more often occurs from the later manifestations of the disease in the husband, as from secretions of open sores on the surface of the body or from the mouth, when moist patches exist there. It has commonly been taught that a child truly inherits syphilis by acquiring the parasites through the semen of the father at the time of conception. This is now denied by the highest authorities (Osler) who affirm that the disease is always acquired by direct infection of the child in the mother's womb, from the mother herself, who in her turn has been infected by the father or by some other person or source. The theory of direct inheritance from the father was based upon the fact that syphilitic babies were born from apparently healthy mothers. The use of the Wassermann test shows that such mothers have syphilis. If, however, the mother acquire syphilis late in pregnancy the child may escape unharmed. A child born apparently healthy of a syphilitic mother may be nursed without danger to the child by the mother, as it has acquired immunity. But if a syphilitic child is born of an apparently healthy mother (but necessarily a syphilitic) there is no danger of the child infecting the mother although it would infect a healthy nurse who merely handled it or suckled it.

The chief social danger of syphilis arises from its introduction into married life and its possible radiations by accidental infection,

through society. Probably one in every five cases of syphilis in women is communicated to them in the marriage relation. There are so many sources and modes of contagion that it is spread from one to another innocently in the ordinary relations of social life. From husband to wife, from wife to child, from child to nurse and other members of the family, so that small epidemics may arise.

As has been seen, a large proportion of the progeny of syphilitics die during pregnancy, or soon after birth, and those who survive are blighted physically and mentally and are unfit for the battle of life. Syphilis has come to be recognized as one of the most powerful factors in the depopulation and degeneration of the race.

The United States Government has issued a bulletin <sup>1</sup> in which the standard of cure is stated to be "one year without treatment, without any suspicious signs, with several negative Wassermann reactions and no positive ones, and with a negative provocative Wassermann reaction (i. e., following a dose of salvarsan in two to fourteen days) and negative luetin test at the end of the year." Luetin is an emulsion of the dead syphilitic germs, one drop of which is mixed with a drop of sterile salt solution and injected under the skin. It gives rise to a pimple or pustule within one or two days, or three or four weeks, in latent, late, and nervous forms of syphilis, but produces no such effect in the absence of syphilis.

### *Prevention of Gonorrhea and Syphilis*

While at first thought it may be questioned whether it is rightly advisable to protect persons from nature's punishment, which so often follows immoral sexual relations, still when we reflect that the existence of sexual disease often endangers absolutely innocent individuals it must be conceded that these must be protected whenever possible.

We will repeat some of the results of sexual disease to emphasize its importance. Accidental infection with syphilis is not a rare occurrence by means of drinking cups, pipes, table implements, napkins and towels, and by instruments used by barbers, manicures, and

<sup>1</sup>Treatment of Syphilis, U. S. Public Health Service, Jan., 1915.

even careless dentists and doctors. By marriage the pure and healthy wife may either become a chronic invalid, a subject for serious surgery, through acquiring gonorrhea from a husband, or even worse, through the same means, may inflict total and incurable blindness on her newborn child, or give birth to progeny cursed with the doom of congenital syphilis acquired from a syphilitic husband and father.

It is now the custom in the United States Navy to give preventive treatment, immediately upon return to their vessels, to men on shore leave who have been exposed, through sexual relations, to gonorrhea and syphilis. The result is that these hitherto most common maladies have been almost abolished on shipboard, where the method is thoroughly carried out.

One of the questions most frequently asked by those with gonorrhea is, When can I safely marry? The germs of gonorrhea, as has been stated, may lie dormant for years in the urinary passage, or glands, or ducts connected with it, only to be stimulated into renewed activity so as to produce a fresh, acute attack (which may be communicated to a woman) through agencies which irritate the part—as by alcoholic or sexual excess.

The man who has had gonorrhea and wishes to marry should present himself to an expert, who will examine any discharge with a microscope, or if there are apparently no signs of trouble, the doctor will pass a sound, massage the prostate gland through the rectum, and get the patient to pass water which may contain the germs. Again, he will require the patient to drink two bottles of beer, to see if the irritation occasioned by this will bring to light any germs in the urine. The newly discovered blood test (complement fixation test) may solve the question without any other examination, and is the simplest means for the patient, although requiring a skillful laboratory man for its performance. The results of the test are very satisfactory, providing the gonorrhea has not been acquired within the previous few months.

Such are the methods which should be employed in the case of any man who has had gonorrhea and wishes to marry—even if he appears perfectly well, has no shreds in his urine, and years have elapsed since apparent cure of his trouble.



In respect to syphilis the now widely known Wassermann test should always be employed on any man who has had gonorrhea before marriage. There are many cases of syphilis acquired during a severe attack of gonorrhea which passed unnoticed at the time.

To prevent the occurrence of sexual disease, immediately after exposure, the following methods have been adopted in the army and navy:—A freshly made twenty per cent. solution of argyrol is dropped into the urinary passage of the male, and the end of the passage pinched for five minutes to prevent the escape of the fluid. One may fill an ordinary medicine dropper full, and use it once and, if done immediately or even within twelve hours of exposure, the argyrol will usually avert the disease. Argyrol is used for many purposes, and no suspicion is attached to the buying of it. Fifteen grains should be bought, and so that it may last, it must be dispensed in a glass bottle; the entire contents should be dissolved in one teaspoonful of lukewarm water when it is to be used.

Following the injection of argyrol, the subject should wash his penis thoroughly in soap and water and then apply to it the following ointment: calomel, 1 drachm; and lanolin, 2 drachms. This will, in all probability, prevent the occurrence of syphilis if applied within twelve hours after exposure. Not the least discomfort is produced by either argyrol or the calomel ointment. Before dropping in the argyrol solution the subject should pass urine, so as to avoid doing so for some hours after using the argyrol.

### INFLAMMATION OF THE BLADDER

#### (*Cystitis*)

Inflammation of the bladder commonly causes frequent and painful urination. The urine is more or less cloudy and tinged with blood, and deposits a sediment on standing.

**Causes.**—The immediate cause of inflammation of the bladder is the presence of germs, but the bladder is very resistant to germs unless it is first irritated by some mechanical or chemical means or by extension of disease of neighboring organs. The germs enter from the blood into the urine in the kidneys, or by means of unclean



instruments, as catheters introduced into the bladder, or by direct extension from the disease of neighboring parts, as in gonorrhea of the sexual organs, or tuberculosis of the kidneys or sexual organs, or from various inflammations of the sexual organs of women, as in childbed infections. One of the commonest forms of cystitis is that caused by the germs inhabiting the bowels (colon bacilli) and these enter the blood and find their way into the urinary tract from the kidneys, especially in persons habitually constipated.

We will mention the causes of irritation and congestion of the bladder which weaken it so that germs can flourish and produce cystitis.

*Mechanical Irritation.*—This is seen in stone in the bladder, also following external blows and injuries, and also in retention of the urine from failure to empty the bladder—owing to spasm from pain or operation, and lastly from tumors.

Thus in men of middle age, or past middle age, enlargement of the prostate gland (not present in females) surrounding the outlet of the bladder, produces retention. While the bladder is emptied regularly, some quantity of urine still remains, decomposes and irritates the bladder. The symptoms of such a condition are frequent passage of urine, the patient arising often at night, and, in advanced cases, inability to pass water at all without the introduction of a catheter.

The diagnosis of enlarged prostate is made by the finger in the lower bowel (rectum) or by means of an instrument passed into the bladder through which one can see by the aid of an electric light.

In young (or older) men, narrowing of the urinary passage (urethra), a sequel to gonorrhea called stricture, may cause retention of urine and cystitis.

In certain spinal diseases and injuries the bladder becomes paralyzed and cannot empty itself, and in consequence cystitis ensues from retention of urine.

*Chemical Irritation.*—Chemical irritation of the bladder arises from an over-acid or over-alkaline urine, from the swallowing of irritants—as certain waters and foods in some persons, large amounts of alcohol, and such drugs as turpentine or cantharides. The latter

may even cause cystitis when used in excess externally. Exposure to cold—as sitting on damp, cold ground—may lead to congestion, and thus to inflammation of the bladder.

**Forms.**—Cystitis may be either acute or chronic. The acute form comes on suddenly and disappears after some days or weeks or merges into the chronic form. It often happens that a severe acute attack appears in a person having a low grade chronic cystitis which has caused little inconvenience.

**Symptoms.**—The combination of frequent and painful urination, with the appearance of blood or white cloudiness and sediment in the urine, are evidences of the existence of inflammation of the bladder (although they are as characteristic of kidney inflammation and stone, tumor, and many other conditions—*See below*). The trouble is aggravated by standing, jolting, or other active exercise. The pain may be felt either at the beginning or end of urination. There is also generally a feeling of weight and heaviness low down in the belly, or about the lower part of the bowel.

Blood is not frequently present, but the urine is not clear if there is much inflammation, and deposits a white, and often slimy, sediment on standing. If much blood escapes in the urine, one must suspect stone, tumor, tuberculosis, etc., and consult an expert in genito-urinary diseases. In chronic inflammation of the bladder the urine sometimes has a foul odor and smells of ammonia.

**Diagnosis.**—Certain points should be strongly emphasized in this connection. Formerly it was taught that microscopical examination of the sediment of the urine would indicate from which parts of the urinary tract cells found in the urine were derived, and, in that way, one could tell precisely what portion of the tract was diseased. This is not the case, and it is a most common mistake of physicians to diagnose cases as cystitis in which the symptoms already described occur.

The same symptoms observed in inflammation of the bladder are also seen in inflammation, tuberculosis, stone, and tumor of the kidneys; and in all cases in which apparent cystitis becomes chronic or in which blood appears in the urine, the newer methods of diagnosis must be employed. Even in cystitis these methods are equally de-

manded to exclude the presence of stone, tuberculosis, tumor, and rare conditions situated in the bladder itself. Indeed, among surgeons, the presentation of a patient supposed to have a chronic cystitis immediately arouses the suspicion of some disease of the kidney or other condition in the bladder, to account for the apparent cystitis. Chronic cystitis is a symptom rather than a disease.

The newer methods enable us to look into the bladder by means of electric illumination, to determine its appearance and contents, to draw urine directly from each kidney, and to determine the size and shape of the cavities in the kidneys and the presence of stone (by means of the x-ray) in any part of the urinary tract.

**Treatment.**—The treatment of acute cystitis consists in rest in bed—preferably on the back, with the legs drawn up. The diet should be chiefly fluid (one glass hourly), as milk, pure water, flax-seed tea, or mineral waters. Potassium citrate (fifteen grains) and sweet spirits of niter (fifteen drops) may be given in water to advantage three times daily. Hot full baths or sitz baths two or three times a day, and in women, hot vaginal douches (that is, injections into the front passage), with hot poultices or the hot water bag over the lower part of the abdomen, will serve to relieve the suffering. If, however, the pain and frequency attending urination is considerable, nothing is so efficient as a suppository containing one-quarter grain each of morphin sulphate<sup>1</sup> and belladonna extract, which should be introduced into the bowel and repeated once in three hours if necessary. This treatment should be employed only on the advice of a physician.

In chronic cystitis, urotropin in ten grain doses in a whole glass of water, and taken four times daily, often affords great relief, but these cases demand careful study by a physician, to determine their cause, and often that local treatment may be given. Urotropin, in the above doses, sometimes upsets the stomach and causes increased irritability of the bladder, in which case the use of the drug must be stopped.

Avoidance of all sources of irritation is also essential in these

<sup>1</sup>Morphin is a powerful drug and can only be obtained with a doctor's prescription.



cases, as sexual excitement, and the use of alcohol and spices. The diet should consist chiefly of cereals and vegetables, with an abundance of milk and water—ten or twelve glasses daily. In acute cystitis, the bowels should be kept loose by means of hot rectal injections.

From what has already been said it will be seen that no disease needs more careful study by an expert, than so-called or apparent inflammation of the bladder, more especially when it tends to become chronic.

#### **RETENTION, STOPPAGE, OR SUPPRESSION OF URINE**

Retention refers to that condition, in which the urine has been accumulating in the bladder for a considerable time—over twelve hours—and cannot be passed. It may follow an obstruction from disease, particularly an enlarged prostate gland (*See* above), to which is added temporary swelling and nervous contraction of some part of the urinary passage; or it may be due to spasm and closure of the outlet from nervous irritation, as in cases of injuries and surgical operations in the vicinity of the sexual organs, the rectum, or in other parts of the body. Overdistention of the bladder from failure to pass water for a long time may lead to a condition where urination becomes an impossibility.

Various general diseases, as severe fevers, and conditions of unconsciousness, and other disorders of the nervous system, are frequently accompanied by retention of urine. In retention of urine, there is often an escape of a little urine from time to time, and not necessarily entire absence of outflow.

**Treatment.**—Retention of urine is a serious condition. If not relieved it may end in death from poisoning, or from rupture of the bladder. Therefore surgical assistance is demanded, as soon as it can be obtained. Failing this, one should begin with the simpler methods.

A hot sitz bath, or, if the patient cannot move, hot applications—as a hot poultice or hot cloths applied over the lower part of the belly—may afford relief. Injections of hot water into the bowel are often still more efficient. A single full dose of opium in some form—as ten drops of laudanum or three teaspoons of paregoric, or one—



quarter grain of morphin<sup>1</sup>—will frequently allow of a free passage of urine. The introduction of a suppository into the bowel, containing one-quarter grain each of morphin sulphate,<sup>1</sup> and belladonna extract, is often preferable to giving the drug by the mouth.

These measures proving of no avail, the next endeavor should be to pass a catheter. If a soft rubber or elastic catheter is used with reasonable care, little damage can be done even by a novice. The catheter should be boiled in water for ten minutes, and after washing his hands thoroughly the attendant should anoint the catheter with sweet oil (which has been boiled), or clean vaselin, and proceed to introduce the catheter slowly into the urinary passage until the urine begins to flow out through the instrument.

A medium-sized catheter is most generally suitable—a number 16 of the French scale or a number 8½ of the English scale.

#### INVOLUNTARY PASSAGE OF URINE—BED-WETTING IN CHILDREN

*(Incontinence of Urine—Enuresis)*

**Causes.**—This refers to an escape of urine from the bladder, uncontrolled by the will. It naturally occurs in infants under thirty months, or thereabouts, and in the very old, and in connection with various diseases. It may be due to diseases of the brain, as in idiocy or insanity, apoplexy, or unconscious states. Injuries or disorders of the spinal cord—the latter controlling the action of the bladder (subject to the brain)—also cause incontinence.

Local disorders of the urinary organs are more frequent causes of the trouble, as inflammation of any part of the urinary tract or private parts, diabetes, Bright's disease of the kidneys, stone in the bladder, tumors, and malformations. The involuntary passage of urine may arise from irritability of bladder—the most frequent cause—or from weakness of the muscles which restrain the escape of urine, or from obstruction to flow of urine from the bladder with overflow, when it becomes distended.

It is a very common disorder of children and young persons, and in some cases no cause can be found; but in many instances it is due

<sup>1</sup>Opium in any of its forms is a powerful drug and can only be obtained with a physician's prescription.

to masturbation; to a narrow foreskin and small aperture at the exit of the urinary passage; to anemia; to constipation; to worms in the bowels or disease of the lower end of the intestines, such as fissure or eczema; to digestive disorders; to retaining the urine for too long a time; to fright; to dream impressions (dreaming of the act of urination); and to great weakness brought on by fever or other diseases.

In old men it is often due to an enlargement of a gland at the neck of the bladder (the prostate gland), which prevents the bladder from closing properly. A concentrated and irritating urine, from excessive acidity or alkalinity, may induce incontinence.

Children may recover from it as they approach adult life, but they should not be punished, as it is a disease and not a fault. Exception should be made in case children wet their clothing during play, through failure to take the time and trouble to pass water naturally. It is more common among children at night, leading to wetting of the bed, but may occur in the day, and often improves in the spring and summer, only to return with the cold weather. Children who sleep very soundly are more apt to be subject to this disorder.

**Treatment.**—In the case of a disorder depending upon one of so many conditions it will be realized that it would be folly for the layman to attempt to treat it. Children who are weak need building up in every possible way—as by an outdoor life, cold sponging daily, etc.

If, in boys, there is a long foreskin, or tight foreskin, hindering the escape of urine and natural secretions of this part, circumcision may be performed to advantage by the surgeon, even in the infant a few weeks old. A somewhat corresponding condition in girls occasionally causes bed-wetting and other troubles. It can be discovered by a physician.

Children who wet their beds, or clothes, should not drink liquid after five o'clock in the afternoon, and should be taken up at ten p. m. to pass water. The bed covering must be light, and children should be prevented from lying on their backs while asleep by wearing a towel knotted in the small part of the back. Elevation of the foot of the bed a few inches is recommended, as having a corrective

influence by taking pressure of the urine from the outlet of the bladder. Masturbation, if present, must be corrected.

It is a very difficult disorder to treat, and one must not be over-critical of a physician for failure to remedy the evil, every attempt having been made to discover and remove the cause; even when cure seems assured, the disorder may recur.

Belladonna is the most successful drug, but can only be used safely and effectively in accordance with a doctor's directions.

## CHAPTER XI

### SEXUAL HYGIENE

Every individual should understand the proper functions of the sexual organs and how to care for them, as well as those of any other part of the body, providing that the instruction be given by the proper person and at the proper time and place. Such information should be imparted to children by parents, guardians, teachers, or physicians at an early age, and if this is neglected through ignorance, false modesty, or erroneous ideas of the nature and purposes of the sexual function, it will surely be supplied in a way later by ignorant companions or evil-minded persons—with correspondingly bad results.

Is it not the most surprising fact that while the influence of sex on the lives of human beings is at times the most powerful in the world, still all reference to it has been omitted in the education of youth until recent years? There is no other responsibility in the whole range of parental duties which is so commonly shirked, and with such deplorable consequences. When the subject is shorn of the morbid and seductive mystery, with which custom has foolishly surrounded it in the past, and when considered in the same spirit with which we study the hygiene of digestion and other normal functions, it will be found possible to give instructions about the sexual functions in a natural way and without exciting unhealthy and morbid curiosity.

A word in the beginning as to the harm produced by the abuse of the sexual function. The injury, while purposely magnified by quacks for reason of gain, is notwithstanding very real. The voluntary exercise of the sexual functions—unlike that of any other important functions or organs—is not necessary to health. On the contrary, abstinence is conducive to health, both mental and physi-



cal, before maturity is reached. Even after maturity, unless marriage occurs or by improper living sexual desires are unnaturally stimulated, it is quite possible to maintain perfect health through life without exercising the sexual functions at all. Frequent or prolonged excitement of the sexual organs causes local disease of these organs and overfatigue and failure of the nervous system which controls not only these organs, but every organ in the body. In other words, nervous breakdown or prostration follows.

Local disorder of the sexual organs is caused by congestion and inflammation which produce impairment of function of the sexual organs, and often pain and distress, and frequency in urination.

Excitement of the sexual organs in youth is particularly harmful because the nervous system is then more susceptible to damage and because there is no limit to the amount of sexual indulgence when self-abuse is practiced. Masturbation may be seen as early as one year of age and in both sexes. Sometimes the sexual organs are not rubbed with the hands, clothing, or against the bed, but the child rubs the thighs together or sits on the floor and crosses the thighs tightly and rocks to and fro. These actions may not be understood and be regarded as mere tricks.

The child should be watched while in bed awake—that is, before sleeping and after waking. Self-abuse may be suspected in children who sleep badly, and are thin, nervous, and haggard looking. Boys who practice self-abuse are sallow, shy, absent-minded, depressed, and have a generally “hang-dog” appearance; they are apt to stay by themselves and cease playing with their fellows. It is unnecessary to further particularize, other than to state that abuse of the sexual organs in the young is usually owing to the almost criminal neglect or ignorance of the child’s parents.

Infants may be punished; older children rewarded for good conduct. We should try not to alarm the patient but, by kindly instruction and judicious oversight in the future, it is always possible to rid the child of his bad habit without leaving serious local damage of the sexual organ, or grave, permanent injury of the nervous system.

The opposite teaching is that peculiar to the advertising quack who prophesies every imaginable evil, from complete loss of sexual

function to insanity. Any real or fancied disorder of the sexual organs is extremely apt to lead to much mental anxiety and depression, so that a cheerful outlook is essential in inspiring effort to correct bad sexual habits, and is wholly warranted in view of entire recovery in most cases of the young who have abused their sexual organs. For it is a sad fact that self-abuse is the rule at some time during boyhood on account of the neglect of parents in exercising proper supervision over the sexual functions of children.

The reticence and disinclination of parents to instruct their children in sexual matters can not be too strongly condemned. It is natural that youth should wish to know something of the origin of life and how human beings come into the world. The mystery and concealment thrown around these matters only serve to stimulate the curiosity. It is a habit of the parents to rebuke the child for asking questions relating to this subject as improper and immodest. The first lesson the child learns is to associate the idea of shame with the sexual organs. Since he is not enlightened by his proper teachers he picks up knowledge where he can get it—which is often from the worst possible sources.

Evasive answers to stave off the dreaded explanation do no good. By securing the child's confidence at the start, one may not only keep him informed but protect him from seeking or even listening to bad counsel.

Self-abuse is very prejudicial to the character, as there is a tendency to dwell on impure thoughts and a constant feeble struggle to resist the practice and a constant failure to do so. Therefore, when the habit is persisted in for a long time there is loss of will power and self-reliance, through the shame caused by not resisting the sexual desires. But as a matter of fact the practice does not commonly result in permanent injury, as it can be readily stopped if taken vigorously in hand, except in the degenerate. As in all other diseases an ounce of prevention is worth a pound of cure.

**Prevention of Unhygienic Conditions.**—Children at the age of three or four should be taught not to touch, handle, rub or irritate their sexual organs in any way whatsoever except insofar as is necessary in urination or in the course of daily

cleansing. Any inclination to do so will usually be found to be due to some local trouble to which a physician's attention should be called and which may generally be readily remedied by him. It is advisable to ask the medical adviser to examine babies after birth for the presence of any existing trouble or abnormality of the sexual organs, as a tight, adherent, or elongated foreskin in boys—and rarely a corresponding condition in girls—may give rise to much local irritation and remote nervous disturbances. The presence of worms may lead to irritation in the bowels which excites masturbation in children.

Girl babies should be watched to prevent them from irritating the external sexual parts by rubbing them between the inner surfaces of the thighs. As the child begins to play with other children he or she should be cautioned to avoid those who in any way try to thwart the parent's advice, and he or she should be instructed to report all such occurrences. Children should not be permitted to sleep together at home or when visiting abroad. Those who have acquired bad habits should be given a hard bed with light covering and be required to arise as soon as they awaken and should not be permitted to read in bed before going to sleep.

A cold bath every morning is recommended; warm baths often initiate the bad habit. There should be no pockets in the trousers in which the boy may thrust his hands and meddle with his penis. A healthy outdoor life is desirable, with swimming and games of all kinds. Riding should be discouraged on account of the local irritation of the saddle on the oversensitive organs. When the desire to masturbate is strong the parts should be bathed in cold water. All the thoughts should be wholesome, and companions, books and plays conducive to concentration of the ideas on sexual matters are to be shunned. Companionship with the opposite sex is not desirable in the young.

At the age of ten or twelve, boys should be instructed by their parents or the family physician concerning the harm of self-abuse, and should be warned against association with improper companions and the reading of filthy literature. The boy should be told that absorption of the semen into the blood will make him manly and



strong, and it must not be wasted. At fourteen to sixteen years of age the boy should be informed of the probability and naturalness of discharges of semen from the penis during sleep. When these occur weekly or at longer intervals they should be considered normal, but when they are experienced as frequently as three times a week the advice of a physician should be sought.

The avoidance of alcohol and tobacco, the sleeping on a hard bed with light covering, and emptying the bladder before retiring, all tend to prevent too great frequency of seminal losses. Sleeping on the back favors the occurrence of seminal discharges and it may be avoided by wearing a belt about the waist with a knot tied in the back.

At fourteen to sixteen the boy should also be instructed in the moral and physical dangers from intercourse with lewd women. He should be told that the physical danger is the probability of infection with gonorrhea and syphilis—one or both; that there is no way by which he can know whether a woman is suffering from these diseases. That there is not only a probability that he suffer permanent disability, should he acquire either of these diseases, but that the permanent damage which he may inflict upon other innocent persons is incalculable.

It is generally known that syphilis is a dreadful disease, but not perhaps that it endangers the lives and happiness of future generations of descendents. Gonorrhea, the much more common disease, and often treated lightly by youth, frequently leads to long, chronic, local disease or fatal disorder of other parts of the body. Later in life it may lead to infection of a wife, resulting in chronic invalidism and necessitating the removal of her maternal organs. These occurrences often appear long after the patient thinks he is free from the disease (*See preceding chapter*).

Gonorrhea is the most frequent cause of sterility in women, and indeed of sterility in men, and is also a common source of abortion and premature birth. It is the cause of most cases of blindness in infants and also of the inflammation of the external sexual organs (vulvovaginitis) in girl babies. It is stated on good authority that eighty per cent. of all males suffer from gonorrhea at some time dur-



ing their lives. The disease is not confined to prostitutes, but is more common in all walks of life and in all classes and ages than is generally suspected. The disease is only too frequent in boys' boarding schools and similar institutions.

It is particularly important that the true situation be explained to boys about to enter college or business, the period of greatest temptation. Next to bad companions alcohol is their greatest foe. Weakened by its influence and under the sway of persuasive friends, the will gives way and advice and warning are likewise forgotten. Idleness is an indirect factor favoring sexual disease, while hard physical and mental labor are powerful sedatives to the sexual passions.

Education in sexual hygiene has advanced greatly during the past few years and associations of physicians have informed the public through lectures to teachers and others, and by pamphlets and special instruction in schools, of the prevalence and great dangers of sexual diseases.

When young adult life has been reached, the parent or physician should inform the young man or woman as to the dangers of close and frequent personal contact with the opposite sex. This applies especially to engaged couples who indulge in frequent caresses. Such contact involves excitement of the sexual organs and causes in time congestion and inflammation of these parts, and is productive of even more harm than excessive sexual intercourse. There is no abatement of the sexual excitement, as naturally follows sexual intercourse, and so the nervous system becomes overwrought and in time there may be a complete nervous breakdown.

Indeed I have known of cases where men's future careers have to a considerable degree been ruined by nervous prostration caused by long engagements. Long engagements—when the participants are frequent companions—are thus decidedly unfortunate. The caress with those of the opposite sex is physiologically the first stage in sexual intercourse, and if it were looked upon in that light, it would certainly be avoided by many of those who now indulge in them by the hour and for indefinite periods.

The symptoms due to continued ungratified sexual excitement

include those peculiar to nervous prostration, as mental depression, weakness, loss of energy and vitality, pain in the back of the neck, etc.; also symptoms indicating local inflammation of the sexual organs, as pain and discomfort about the back part of the urinary passage in man, and increased excitability followed by loss of sexual power in the course of time. This is another example of great harm that often comes to innocent and well-meaning persons through ignorance for which there should be no excuse. The writer knows of a young medical man who was a sufferer for years from chronic inflammation of the sexual organs and accompanying nervous breakdown because of a long engagement, and notwithstanding the fact that he was a graduate of one of the leading medical schools of the country he had never received any instruction on this shunned subject. Ignorance was the sole cause of a long unhappiness and of an interference with what would otherwise have been a successful career.

Young women about to marry should receive instruction from physicians or their mothers as to the sexual relations which will exist after marriage. Most girls, of the more refined classes, are often allowed to grow up wholly ignorant of such matters, and in consequence become greatly shocked and even disgusted by the sexual relations after marriage—fancying that there must be something unnatural and wrong about them because the subject was avoided by those responsible for the girl's welfare. Such a condition may lead to much marital unhappiness.

In relation to sexual intercourse, no rule as to frequency can be laid down. There is as much difference in the sexual powers of different persons as in muscular power or any other bodily function. In a general way it may be said that sexual intercourse is excessive for most persons if indulged in more than twice a week. A greater frequency in the beginning than this (intercourse twice a week), and gradually diminishing frequency in later married life, is the rule. Sexual intercourse should be followed by sleep and a feeling of freshness. Exhaustion, weariness, headache, loss of appetite, energy, ambition, and zest for work; indigestion, vague pains in the loins, loss of interest in society, irritability, indecision, and in women vaginal discharge, are some of the symptoms of sexual immoderation.

When there is difficulty in restraining the sexual desires, husband and wife should occupy separate beds or rooms.

Intercourse during pregnancy is not harmful if not excessive and if it does not occur at the times when the woman would naturally menstruate, if not pregnant. Excessive intercourse during pregnancy is a common cause of miscarriage. Sexual intercourse is unwise during the regular "unwell" periods of women, and in the last month of pregnancy, and for one month after childbirth or miscarriage.

Also in the case of women who have previously miscarried, intercourse is inadvisable near the period of the former miscarriage. Again, if miscarriage threatens, as shown by the occurrence of flowing during pregnancy, there should be a cessation of sexual relations for a time. Any deviation from the natural mode of intercourse is pretty certain to lead to physical disaster. Thus unnatural prolongation of the act or withdrawal on the part of the man before natural completion of the act, in order to prevent conception, often results in deplorable nervous disorders in the case of one or both parties.

The prevention of conception is often as immoral as the destruction of the fetus is criminal by means of attempted abortion. At times the prevention of conception is proper and justifiable, as when the wife is unfit to bear children or has borne too many, or circumstances will not permit of the proper raising of children. There is no doubt that race suicide is chiefly due to selfishness and disinclination of parents to undertake the duty of rearing children and that it is owing to the use of artificial methods preventing conception rather than any failure in the ability to conceive children. Conception is most apt to occur when intercourse takes place during the first eight days after the cessation of menstruation, and is least prone to occur when intercourse is had between the fourteenth and twenty-first day after the cessation of menstruation. While conception is least apt to follow intercourse during the latter period, still there is no time in which conception may not take place.

It may not be amiss in this place to say a few words concerning the honeymoon. The fashion of traveling and sight-seeing is not advisable unless it may be done in a long and leisurely trip. The time is one of unusual drain upon the nervous system and a stay in a quiet

and secluded country place is preferable to any other. A child is also more apt to be delicate when conceived by parents who were at the time in a state of exhaustion. It is not unusual also for those visiting the gayer resorts to indulge in champagne or other wine during the honeymoon to celebrate the happy event, although neither party is an habitual user of alcohol. But it may be pointed out here that conception is apt to occur at this period, and conception which occurs when there is alcohol circulating in the blood of either parent is fraught with danger to the offspring. The greatest authorities in the world on this subject, Professors Forel and Kraepelin, have shown that the offspring of such a conception is subject to neurasthenia, nervousness, and unhappiness, if not to genuine mental disease, idiocy, and epilepsy.



## CHAPTER XII

### THE EYE AND EAR

Foreign bodies in the eye. Black eye. Inflammations of the eyelids. Sty. Twitching of the eyelids. Wounds and burns of the eyelids. Pink eye. Eye strain. Far- and near-sight. Astigmatism. Strain of eye-muscles. Sudden deafness from wax. Deafness from catarrh. Foreign bodies in the ear. Severe earache. Abscess of the ear. Slight earache. Mastoid inflammation.

### DISEASES OF THE EYE

#### CINDERS AND OTHER FOREIGN BODIES IN THE EYE

Foreign bodies are most frequently lodged on the under surface of the upper lid (Fig. 65), although the surface of the eyeball and the inner aspect of the lower lid should also be carefully inspected.

**Treatment.**—A drop of a two-per-cent. solution of cocain will render the manipulations painless. The patient should be directed to continue looking downward, and the lashes and edge of the lid should be grasped by the forefinger and thumb of the right hand, while a very small pencil is gently pressed against the upper part of the lid, the lower part being lifted outward and upward against the pencil so that it is turned inside out. The lid may be kept in this position by a little pressure on the lashes, while the cinder, or whatever foreign body it may be, is removed by gently sweeping it off the mucous membrane with a fold of a soft, clean handkerchief, or by the aid of a sharp wooden toothpick having a little absorbent cotton wrapped over its point.



FIG. 65.—USUAL POINT OF LODGMENT OF FOREIGN BODY ON THE INNER SURFACE OF UPPER LID (a). Here the lid is turned inside out.

Hot cinders and pieces of metal may become so deeply lodged in

the surface of the eye that it is necessary to dig them out with a needle (which has been passed through a flame to kill the germs on it), after cocain solution has been dropped into the eye twice at minute intervals. Such a procedure is, of course, appropriate for an oculist, but when it is impossible to secure medical aid for days it can be attempted without much fear, if done carefully, as more harm will result if the offending body is left in place. It is surprising to see how quickly a hole in the surface of the eye will fill up in a few days. If the foreign body has caused a good deal of irritation before its removal, it is best to drop a solution of boric acid (ten grains to the ounce of water) into the eye four times daily.

#### **"BLACK EYE"**

To relieve this condition it is necessary to treat the eye immediately after the accident. This can be done by applying to the closed lids, every three minutes, little squares of white cotton or linen, fourfold and about as large as a silver dollar, that have lain on a cake of ice until thoroughly cold. This treatment is most effective when pursued almost continuously for hours. The cold compresses should not be permitted to overlap the nose, or a violent cold in the head may ensue.

The swelling having subsided, the discoloration next occupies our attention. This may be removed speedily by applying, more or less constantly below the lower lid, little pieces of flannel dipped in water as hot as can be borne. The cloths must be changed as often as they cool. This treatment should be repeated for one-half hour every two hours or so during the day. If treatment has not been applied the first two days there is no remedy for the discoloration except painting the blackened skin a flesh tint with water colors.

#### **INFLAMMATION OF THE EDGE OF THE EYELIDS**

*(Blepharitis marginalis)*

This is a condition in which the edges of the eyelids are red; in severe cases there is a formation of minute scales on them and loss of the eyelashes. The condition is often very chronic.

**Causes.**—It is due in children to poor nutrition, and in adults to errors of vision—as astigmatism—which may be corrected by glasses. In milder cases there are burning, itching, and smarting of the lids, especially after exposure to wind and sun or after constant use of the eyes in a bad light.

**Treatment.**—An ointment containing one grain of the yellow oxid of mercury to one dram of vaselin, rubbed on the lids each night on retiring, is most useful.

But the scales must first be thoroughly removed by bathing the lids with warm water, and loose lashes should be pulled out. An oculist should be consulted to see if eye strain is not present, which could be corrected by glasses; and the general health of children must be improved.

### STYE

A sty is a boil on the eyelid. It begins at the root of a hair as a hard swelling which may extend to the whole lid. The tip of the swelling takes on a yellowish color, breaks down, and discharges “matter” or pus. There is pain and a feeling of tension in the lid, and very rarely, some fever.

**Causes.**—The most common cause of styes is inflammation of the edges of the eyelids. When one sty follows another it is well to have the eyes examined by an oculist, as eye strain often favors the trouble, and this can be corrected by the use of glasses. Otherwise the patient is probably “run down” from chronic constipation and anemia (poverty of the blood) and other causes, and needs a change of air, tonics, and exercise out of doors. Rubbing the lids causes introduction of pus germs.

**Treatment.**—The immediate treatment, which may cut short the trouble, consists in bathing the eyelid for fifteen minutes at a time, every hour, with a hot solution of boric acid (one-half a teaspoonful to each cup of water).

Pulling out the eyelash which runs through the sty and touching the swelling with a toothpick dipped in tincture of iodine (from which the excess has been shaken off) may stop the development if applied early. Pushing a sharpened toothpick into the middle of the sty, after the former has been moistened with pure carbolic acid, is even

more efficacious, but one must be careful not to have any excess of acid on the toothpick to get into the eye.

If the styte persists in progressing, bathing it frequently in hot water will cause it to discharge pus and terminate much sooner. After matter has escaped and the styte begins to improve it is best to apply the mercury ointment advised in this chapter for inflammation of the lids.

#### TWITCHING OF THE EYELIDS

This condition may be due to eye strain, and can be relieved if the eyes are fitted to glasses by an oculist (not an optician).

It is frequently an accompaniment of inflammation of the eyes, and when this is cured the twitching of the lids disappears. When the eyes are otherwise normal the twitching is frequently one of the signs of nerve fag and overwork.

#### WOUNDS AND BURNS ABOUT THE EYES

**Treatment for Slight Wounds.**—Slight wounds of the inner surface of the eyelids close readily without stitching, if boric acid solution (ten grains to each ounce of water) is dropped into the eye four times daily.

**Treatment for Burns of Inner Surface.**—Burns of the inner surface of the lids follow the entrance of hot water, hot ashes, lime, acids, and molten metals. Burns produced by lime are treated by dropping milk, sweet oil, or a solution of vinegar (one part of vinegar to four of water) into the eye, while those caused by acids are relieved by similar treatment with lime water or solution of baking soda (one-half a teaspoonful to each glass of water). If these remedies are not at hand, the essential object is attained by washing the eye with a strong current of water, as from a fountain syringe. If there is much swelling of the lids, and inflammation after the accident, boric acid solution should be dropped into the eye four times daily.

**Treatment of Severe Burns.**—In severe burns of the inner surface of the lids and eyeball vaselin should be kept continuously in the eye, or sweet oil or castor oil should be dropped frequently in the eye to relieve the pain and prevent the lids from sticking to the eyeball.



Two grains of atropin sulphate to each ounce of castor oil renders it more useful, but no more than a drop of the oil should be dropped in the eye after using the boric acid. Treatment by cold compresses, as recommended for "black eye," will do much also to quiet the irritation, and the patient should wear a bandage over the eye or dark glasses.

### SORE EYES

The mucous membrane lining the inner surface of the eyelids also covers the front of the white of the eyeball, although so transparent here that it is not apparent to the observer. Inflammation of this membrane is more commonly limited to that portion covering the inner surfaces of the lids, but may extend to the eyeball when the eye becomes "bloodshot" and the condition more serious.

For the sake of convenience we may speak of a mild form of sore eye, as (*a*) congestion of the eyelids, and the more severe type, as (*b*) conjunctivitis.

#### (*a*) CONGESTION OF THE EYELIDS

**Causes.**—This may be caused by smoke or dust in the atmosphere, or by foreign bodies in the eye; frequently it is due to eye strain, or to far- or near-sightedness, astigmatism, or muscular weakness, which may be corrected by an oculist's (never an optician's) prescription for glasses. Exposure to an excessive glare of light, as in the case of firemen, or, on the other hand, reading constantly and often in a poor light, will induce irritation of the lids. The germs which cause "cold in the head" often find their way into the eyes through the tear ducts, which connect the inner corner of the eyes with the nose, and thus may set up similar trouble in the eyes.

**Symptoms.**—The eyes feel weary and "as if there were sand in them." There may also be smarting, burning, or itching of the lids, and there is disinclination for any prolonged use of the eyes. The lids, when examined, are found to be much deeper red than usual, and slightly swollen; but there is no discharge from the eye, and this fact serves to distinguish this mild type of inflammation

from the more severe form, although the lids may have a tendency to stick together on waking.

**Treatment.**—The use of dark glasses and a few drops of a solution, containing ten grains of boric acid and one-half grain of zinc sulphate to each ounce of water, in the eye, three times daily, will often cure the trouble. Also bathing the eyes in very hot or cold water several times daily will usually give much relief. If this treatment does not do so within a few days, an oculist should be consulted, and it will frequently be found that glasses are needed to secure freedom from irritation of the eyes.

In using "eye drops" the head should be held back, and several drops be squeezed from a medicine dropper into the inner corner of the eye.

### (b) CONJUNCTIVITIS

#### *(Catarrhal Inflammation of the Eyes)*

**Symptoms.**—In this disorder there is discharge which sticks the lids together during the night. The inner surface of the lids is much reddened, the blood vessels in the lining membrane are enlarged, and the lids are slightly swollen. The redness may extend to the eyeball and give it a bloodshot appearance. There is no interference with sight other than momentary blurring caused by the discharge, and occasionally there is very severe pain, as if a cinder had suddenly fallen in the eye. This symptom may occur at night and awaken the patient, and may be the reason for his first consulting a physician.

One eye is commonly attacked twenty-four to thirty-six hours before the other, and even if it is thought that the cause is a cinder, in case of one eye, it can hardly be possible to sustain this belief in the case of the involvement of both eyes. There is a feeling of discomfort about the eyes, and often a burning and constant watering, the tears containing flakes of white discharge.

**Causes and Treatment.**—When the discharge is a copious, creamy pus or "matter," associated with great swelling of the lids and pain on exposure to light, the cause is usually a germ of a special disease (purulent conjunctivitis) and the eyesight will very prob-

ably be lost unless a skillful physician be immediately secured. Early treatment is, however, of great service, and, until a physician can be obtained, the treatment recommended below should be followed conscientiously; by this means the sight may be saved.

This purulent variety of inflammation of the eyes is not rare in the newborn, and is the usual source of that form of blindness with which babies are commonly said to have been born. It can be prevented by dropping a two per cent. solution of silver nitrate in each eye of the newborn infant—and this is the rule with the careful doctor.

All forms of severe inflammation of the lids are contagious, especially the variety last considered, and can be conveyed, by means of the discharge, through the agency of towels, handkerchiefs, soap, wash basins, etc., and will produce the same or sometimes different types of inflammation in healthy eyes. Therefore, if the severe form of conjunctivitis breaks out among any large number of people, as in schools, prisons, asylums, and almshouses, isolation of the patients should be enforced.

In the milder attacks of conjunctivitis the treatment should be that recommended above for congestion of the lids. The swelling and inflammation, in the severer types, are greatly relieved by the application of the cold water compresses, advised under the section on "Black Eye," for an hour at a time, thrice daily. Confinement in a dark room, or the use of dark glasses, and drops of zinc sulphate solution (one-half grain in an ounce of water) three times a day, with hourly dropping of boric acid (ten grains to each ounce of water) constitute the ordinary treatment. If this treatment is not promptly efficacious, one may drop a freshly prepared ten per cent. solution of argyrol into the eyes three times daily, in place of the boric acid and zinc sulphate solutions.

In inflammations with copious discharge of creamy pus, and great swelling of the lids, the eyes should be washed well with the boric acid solution every half hour, and a solution of silver nitrate (two grains to each ounce of water) dropped into the eye, once daily, followed immediately by a weak solution of common salt in water to neutralize the nitrate of silver, after its action has been secured. Or

a fresh solution (fifty per cent.) of argyrol is often now used, in place of the silver nitrate, as it is not irritating, and may be used three times daily. The constant use of ice cloths, already mentioned (under Black Eye), forms a necessary adjunct of treatment.

The sound eye must be protected from the chance of contagion, arising from a possible infection from the pus discharging from its mate. This may be secured by bandaging the well eye, or, better, by covering it with a watch crystal kept in place by surgeon's plaster.

In treating sore eyes with discharges, in babies, the patient should be held in the lap with his head backward and inclined toward the side of the sore eye, so that in washing the eye no discharge will flow into the sound eye. The boric acid may then be dropped from a medicine dropper, or applied upon a little wad of absorbent cotton to the inner corner of the eye, while the eyelids are held apart.

Hemorrhages occurring under the conjunctiva (or membrane lining the inner surface of the lids and covering the front surface of the white of the eyeball) may be caused by blows or other injury to the eye, by violent coughing, by straining, etc. Dark-red spots may appear in the white of the eyeball, slightly raised above the surface, which are little blood clots under the conjunctival membrane. No special trouble results, and there is nothing to be done except to wait until the blood is absorbed, which will happen in time. If the eyes water, solution of zinc sulphate (one-half grain to ounce of water) may be dropped into the eye, twice daily. Hot applications are beneficial here to promote absorption of the clot.

#### "PINK EYE"

**Causes.**—This is a severe epidemic form of catarrh of the eye, which is caused by various special germs, more often the germs of pneumonia and the so-called Week's bacillus, also by the ordinary germs causing inflammation of wounds (streptococci and staphylococci).

"Catching cold," chronic nasal catarrh, exposure to foul vapors and gases, or tobacco smoke, and the other causes enumerated, as leading to congestion of the lids, are also responsible for catarrhal inflammation of the eye.



**Treatment.**—The treatment of this is the same as outlined above under Conjunctivitis.

### EYE STRAIN

Eye strain is commonly due either to astigmatism, nearsightedness, farsightedness, or weakness of the eye muscles.

The farsighted eye is one in which parallel rays entering the eye, as from a distance, come to a focus behind the retina (Fig. 66).

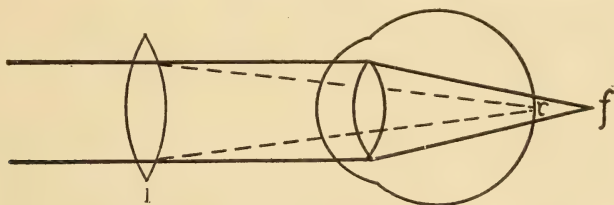


FIG. 66.—FARSIGHTED (HYPEROPIC) EYE FOCUSING PARALLEL RAYS OF LIGHT BEHIND THE RETINA AT  $f$ . A CONVEX GLASS (l) IS REQUIRED TO CONVERGE THE RAYS (DOTTED LINE) SO THAT THEY WILL FOCUS EXACTLY ON THE RETINA AT  $r$ .

The retina is the sensitive area for receiving light impressions in the back of the eyeball. Sight is really a brain function; one sees with the brain, since the optic nerve endings in the back of the eye (retina) merely carry light impressions to the brain where they are properly interpreted.

In order that vision be clear and perfect, it is essential that the rays of light entering the eye be bent so that they strike the retina as a single point (Fig. 67). In the farsighted or hyperopic eye, the eyeball is usually too short for the rays to

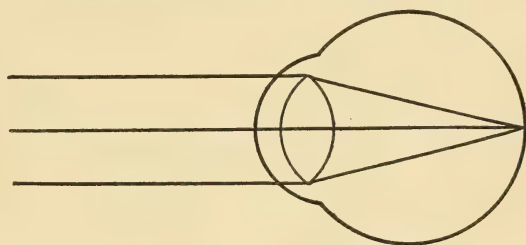


FIG. 67.—FOCUSING OF LIGHT RAYS IN A NORMAL (EMMETROPIC) EYE.

be properly focused on the sensitive nerve area in the back of the eye. A farsighted eye is one smaller than it should be—an undeveloped eye. Parallel rays from distant objects are focused better than converging rays from near objects as shown in Figure 68, where h. h. are the parallel rays, and N rays from a near object.

This defect in vision is, however, overcome by the act of "accommodation." There is a beautiful transparent, double-convex body,

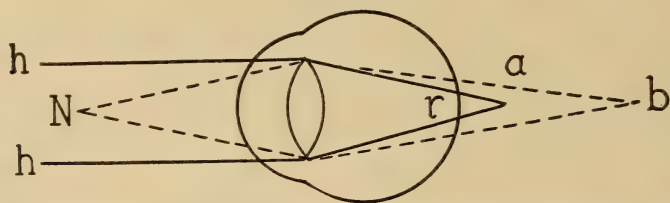


FIG. 68.—FARSIGHTED (HYPEROPIC) EYE SHOWING THE FOCUSING OF RAYS FROM NEAR (N) AND FAR OBJECTS (h) BEHIND THE RETINA.

about one-third of an inch thick, which looks very much like an ordinary glass lens, and is situated in the eye just back of the pupil. This is what is known as the crystalline lens, and the rays of light are bent

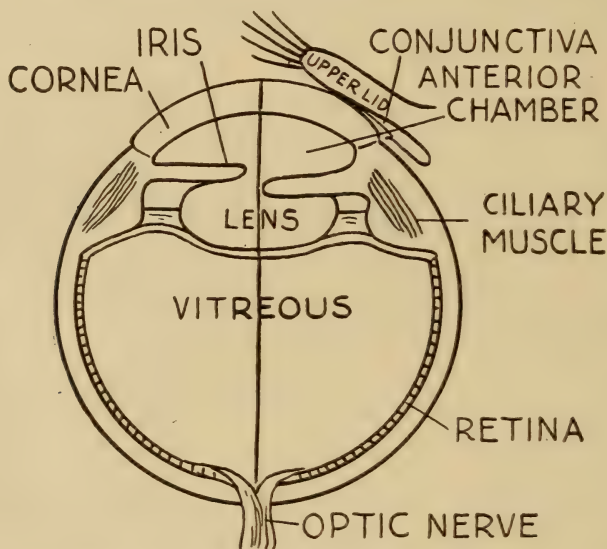


FIG. 69.—DURING ACCOMMODATION THE LENS BECOMES MORE CONVEX THROUGH CONTRACTION OF THE CILIARY MUSCLE, AS SHOWN IN THE LEFT OF THE DIAGRAM, WHILE TO THE RIGHT OF THE LINE DRAWN THROUGH THE EYE IS SHOWN THE POSITION OF THE LENS AT REST.

in passing through it so as to be properly focused on the retina (*See* Fig. 69).

The foregoing statements have been made as though objects were always at a distance from the eye, so that the rays of light coming

from them were almost parallel. Yet when one is looking at an object within a few inches of the eye the rays diverge or spread out, and these the normal eye (if rigid) could not focus on the retina—much less the farsighted eye. But the eye is adaptable to change of focus, through the action of the ciliary muscle which controls to a considerable extent the shape of the lens, and is situated within the eyeball surrounding the lens.

When the ciliary muscle contracts it allows the lens to bulge forward by virtue of its elasticity, and, therefore, to become more convex. This is what happens when one looks at near objects, the increased convexity of the lens bending the rays of light so that they will focus as a point on the retina.

Now in the farsighted eye this muscular control or “accommodative action” must be continually exercised even in looking at distant objects, and it is this constant attempt of nature to cure an optical defect of the eye which frequently leads to nervous exhaustion or eye strain. The nerve centers, which animate and control the nerves supplying the eye muscles to which we have just alluded, are in close proximity to other most important nerve centers in the brain, so that the irritation of the eye centers will produce sympathetic irritation of these other centers, leading to manifold and complex symptoms which we will describe under symptoms of eye strain. But these symptoms do not necessarily develop in every one having farsightedness or astigmatism, since both are often present at birth.

The power of accommodation is sufficient to overcome the optical defect of the eye, providing that the general health is good and the eye is not used much for near work. If, on the other hand, excessive use of the eyes in reading, writing, figuring, sewing, or other fine work is required, and especially if the health becomes impaired, it happens that the constant drain on the eye center in the brain will result in a group of symptoms which we will consider later. Failure of accommodation comes on at about forty, and gradually increases until all accommodation is lost, at the age of seventy-five.

For this reason it is necessary for persons over forty-five years of age, having normal or farsighted eyes, to wear convex glasses in reading or doing near work, and these should be changed for stronger

ones every year or two. These convex glasses save the eyes in their attempts to make the lens more convex when looking at near objects in farsightedness, and also prove serviceable in the same manner when accommodation begins to fail in the case of what is called "old sight." Neglect to provide proper glasses for reading at any time after the age of forty-five, and the failure to replace them by stronger lenses when required, distinctly favor the occurrence of cataract in later life.

In the act of accommodation, in addition to the muscular action by which the lens is made more convex, there is usually contraction of another group of muscles outside the eyeball, which turn the eyes inward when they are directed toward a near object. Here then is another source of trouble resulting from farsightedness, i. e., the not infrequent occurrence of inward "squint" occasioned by the constant use of the muscles pulling the eyes inward during accommodation for near objects. Again, inflammation of the eyelids, and sometimes of deeper parts of the eyeball, follows untreated hyperopia (farsightedness). Early distaste for reading is often acquired by farsighted persons, owing to the strain on the accommodative apparatus. The convex lens is that used to correct farsightedness (*See* Fig. 66.

**NEARSIGHTED EYE.**—In the nearsighted eye the eyeball is too long for parallel rays entering the eye to be focused upon the retina; they are bent, instead, to a point in front of the retina, and then diverge, making the vision blurred. The act of accommodation in making the lens more convex will not aid this condition but only make it worse, so that it is not attempted.

Eye strain in this optical defect is brought on by constant use of the eye muscles (attached to the inner surface of the outside of the eyeball) in directing both eyes inward so that they will both center on near objects—the only ones which can be seen. Outward squint frequently results, because the muscular efforts required to direct both eyes equally inward to see near objects are so great that the use of both eyes together is given up, and the poorer eye is not used and squints outward, while the better eye is turned inward in the endeavor to see.



Nearsighted persons are apt to stoop, owing to the habitual necessity for coming close to the object looked at. Their facial expression is also likely to be rather vacant, since they do not distinctly see, and do not respond to the facial movements of others.

Nearsightedness, or myopia, is not a congenital defect, but is usually acquired, owing to excessive near work which requires that the eye muscles constantly direct both eyes inward to see near objects. In so acting the muscles compress the sides of the eyeballs and tend to increase their length, interfere with their nutrition, and aggravate the condition when it is once begun. Concave lenses are used to correct myopia, and they must be worn all the time.

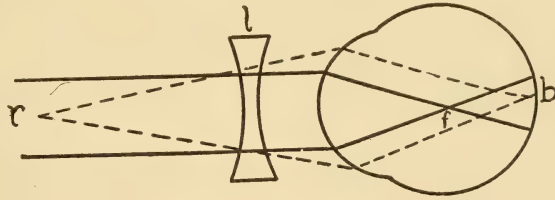


FIG. 70.—NEARSIGHTED OR MYOPIC EYE FOCUSING PARALLEL RAYS FROM A DISTANT OBJECT AT  $f$  IN FRONT OF THE RETINA. A CONCAVE LENS ( $l$ ) WILL CAUSE PARALLEL RAYS TO DIVERGE, AS FROM A NEAR OBJECT ( $r$ ); AND SO FOCUS EXACTLY ON THE RETINA AS AT  $b$ .

#### ASTIGMATISM.

—This is a condition caused by in-

equality of the outer surface of the front of the eyeball, and rarely by a similar defect in the surfaces of the lens. The curvature of the eyeball in the astigmatic eye is greater in one meridian than in the opposite; in other words, the front of the eyeball is not regularly spherical, but bulges along a certain line or meridian, while the curvature is flattened or normal in the other meridian. For instance, if two imaginary lines were drawn, one vertically and the other horizontally across the front of the eyeball, intersecting in the center of the pupil, they would represent the principal meridians—the vertical and the horizontal. As a rule the meridian of greatest curvature is approximately vertical, and that of least curvature is at right angles to it, or horizontal.

Rays of light in passing through the different meridians of the astigmatic eye are differently bent, so that in one of the principal meridians rays may focus perfectly on the retina, while in the other the rays may focus on a point behind the retinal field. In this case the eye is made farsighted or hyperopic in one meridian, and

is normal in the other. Or again, the rays may be focused in front of the retina in one meridian, and directly on the retina in the other; this would be an example of nearsighted or myopic astigmatism.

Farsightedness and nearsightedness are then both caused by astigmatism, although in this case not by the length of the eyeball, but by inequality in the curvature of the front part (cornea) of the eyeball.

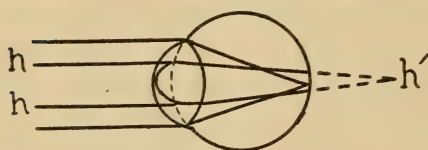


FIG. 71.—SIMPLE HYPEROPIC ASTIGMATISM.  
The Rays *h. h.* Pass through the Vertical or Hyperopic Meridian and are Focused Behind the Retina at *h'*.

For example, in simple astigmatism one of the principal meridians is hyperopic (turning the rays so that they focus behind the retina) or myopic (bending the rays so that they focus in front of the retina, while the other

meridian is normal). In mixed astigmatism, one of the principal meridians is myopic, the other hyperopic; in compound astigmatism the principal meridians are both myopic, or both hyperopic, but differ in degree; while in irregular astigmatism, rays of light passing through different parts of the outer surface of the eyeball are turned in so many various directions that they can never be brought to a perfect focus by glasses.

It is not by any means possible for a layman to be able always to inform himself that he is astigmatic, unless the defect is considerable. If a card, on which are heavy black lines of equal size and radiating from a common center like the spokes of a wheel, be placed

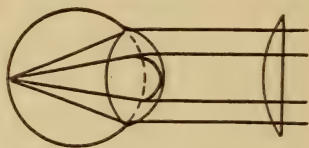


FIG. 72.—SIMPLE HYPEROPIC ASTIGMATISM SHOWN IN FIG. 95, CORRECTED BY A CONVEX CYLINDRICAL GLASS.

on a wall in good light, it will appear to the astigmatic eye as if certain lines (which are in the faulty meridian of the eyeball) are much blurred, while the lines at right angles to these are clear and distinct. Each eye should be tested separately, the other being closed. The chart should be viewed from a distance as great as any part of it can be seen distinctly. All the lines on the test card should look equally black and clear to the normal eye.

Astigmatism is corrected by a cylindrical lens, which is in fact a

segment of a solid cylinder of glass. The axis of the cylindrical lens should be at right angles to the defective meridian of the eye, in order to correct the astigmatism (Figs. 71 and 72).

Eye strain is caused by astigmatism in the same manner that it is brought about in the simple farsighted eye, i. e., by constant strain on the ciliary muscle, which regulates the convexity of the crystalline lens. For it is possible for the inequalities of the front surface of the eyeball, or of the lens, to be offset or counterbalanced by change in the convexity of the lens produced by the action of this muscle, and it is conceivable that the axis of the lens may be tilted one way or another by the same agency, and for the same purpose. But, as we have already pointed out, this continual muscular action entails great strain on the nerve centers which animate the muscle, and if constant near work is requisite, or the health is impaired, the nervous exhaustion becomes apparent. The lesser degrees of astigmatism often give more trouble than the greater.

**WEAKNESS OF THE EYE MUSCLES.**—There are six muscles attached to the outside of the eyeball (Fig. 73) which pull it in various directions, and so enable each eye to be directed upon a common point—otherwise objects will appear double. Weakness of these muscles or insufficiency, especially of those required to direct the eyes inward for near work, may lead to symptoms of eye strain. When reading, for example, the muscles which pull the eye inward soon grow tired and relax, allowing the opposing muscles to pull the eye outward so that the eyes are no longer directed toward a common point, and two images may be perceived or, more frequently, they become fused, producing a general blurring on the page. Then by a new effort of will the internal muscles pull the eyes into line again, only to have the performance repeated—all of which entails a great strain upon the nervous system, and may lead to permanent squint, as has been pointed out. In addition to these symptoms caused by weakness of the eye muscles—seeing double, blurred vision, and want of endurance for close work—there are others which are common to eye strain in general, as headache, nausea, etc., described in the following paragraph.

**Symptoms of Eye Strain.**—Headache is the most frequent



symptom. It may be about the eyes, but there is no special characteristic which will positively enable one to differentiate an eye headache from that arising from other sources, although eye strain is probably the most common cause of headache. Persons with habitual or frequent headaches should, as a matter of routine, have their eyes tested by an able oculist (not an optician).

The headache resulting from eye strain may then be in the forehead, temples, top or the back of the head, or limited to one side. It frequently takes the form of "sick headache." It is perhaps more

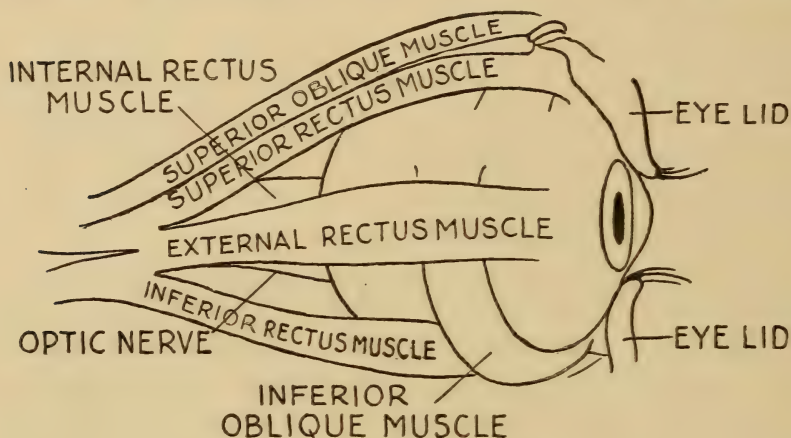


FIG. 73.—OUTSIDE OF THE EYEBALL.

apt to appear after any unusual use of the eyes in reading, writing, sewing, riding, shopping, or sight-seeing, and going to theaters and picture galleries, but this is not by any means invariably the case, as eye headache may appear without apparent cause.

Nausea and vomiting, with or without headache, nervousness, sleeplessness, and dizziness, often accompany eye strain. Sometimes there is weakness of the eyes, i. e., lack of endurance for eye work, twitching of the eyelids, weeping, styes, and inflammation of the lids.

In view of the extreme frequency of eye disorders which lead to eye strain, it behooves people, in the words of an eminent medical writer, to recognize that "the subtle influence of eye strain upon character is of enormous importance" inasmuch as "the disposition may be warped, injured, and wrecked," especially in the young.



Some of the more serious nervous diseases—as nervous exhaustion, convulsions, hysteria, and St. Vitus's dance—may be caused by the reflex irritation of the central nervous system following eye strain.

**Treatment of Eye Strain.**—The essential treatment of eye strain consists in the wearing of proper glasses. It should be a rule, without any exception, to consult a competent oculist—and never an optician—for the selection of glasses. It is as egregious a piece of folly to employ an optician to choose the glasses as it would be to seek an apothecary's advice in a general illness. Considerably more damage would probably accrue from following the optician's prescription than that of the apothecary, because nature would soon offset the effects of an inappropriate drug; but the damage to the eyes from wearing improper glasses would be lasting.

Properly to determine the optical error in astigmatic and farsighted eyes it is essential to place drops in the eye, which dilate the pupil and paralyze the muscles that control the convexity of the crystalline lens, and to use instruments and methods of examination, which can only be properly undertaken and interpreted by one with the general and special medical training possessed by an oculist.

The statement has been emphasized that farsighted and astigmatic persons, up to the age of forty-five or fifty, can sometimes overcome the optical defects in their eyes by exercise of the ciliary muscle which alters the shape of the lens, and therefore, it would be impossible for an examiner to discover the fault without putting drops in the eye, which temporarily paralyze the ciliary muscles for from thirty-six to forty-eight hours, but otherwise do no harm. After the age of fifty it may be unnecessary to use drops, as the muscular power to alter the convexity of the lens is greatly diminished.

Opticians are incompetent to employ these drops, as they may do great damage in certain conditions of the eye which can only be detected by a medical man specially trained for such work. Opticians are thus sure to be caught on one of the horns of a dilemma; either they do not use drops to paralyze the ciliary muscle, or, if they do employ the drops, they may do irreparable damage to the eye.

Any abnormality connected with the vision, especially in children, should be a warning to consult an oculist. Squint, "cross-eye"

(strabismus), as has been stated, may often result from near- or far-sightedness, and it may be possible in young children to cure the squint by the use of glasses or even drops in the eye, whereas in later life it may be necessary to cut some of the muscles of the eyeball to correct the condition. It is a wise rule to subject every child to an oculist's examination before entering upon school life.

## DISEASES OF THE EAR

### DEAFNESS

Sudden deafness without apparent reason is more apt to result from an accumulation of wax than from any other cause. It is a very common ear disorder.

The opening into the ear is about an inch long, or a little more, and is separated from that part of the ear within, which is known as the middle ear, by the ear drum membrane. The drum membrane is a thin, skinlike membrane stretched tightly across the inner end of the external opening in the ear, or auditory canal, and shuts it off completely from the middle ear within, in this way protecting the middle ear from the entrance of germs, dust, and water, but only secondarily aids in hearing. The obstruction caused by wax usually exists in about the middle of the auditory canal or opening in the ear, and only causes deafness when it completely blocks this passage.

The deafness is sudden, because, owing to the accidental entrance of water, the wax quickly swells and chokes the canal; or, in attempts to relieve irritation in the ear, the finger or some other object is thrust into the opening in the ear (auditory canal) and presses the wax down on the ear drum. The obstruction in the ear is usually a mixture of waxy secretion from the canal, and little scales of dead skin which become matted in unwise efforts at cleansing the ear by introducing a twisted towel or some other object into the ear passage and there turning it about; or it may occur owing to disease of the ear altering the character of the natural secretion.

In the normal state, the purpose of the wax is, apparently, to repel insects and to glue together the little flakes of cast-off skin

in the auditory canal, and these, catching on the hairs lining the canal, are thrown out of the ears upon the shoulder by the motion of the jaws in eating.

Nothing should be introduced into the ear with the idea of cleansing it, as the skin growing more rapidly from within tends naturally to push the dead portions out as required, and so the canal is self-cleansing.

**Symptoms.**—Sudden deafness in one ear usually calls the attention of the patient to an accumulation of wax. There is apt to be more or less wax in the other ear as well.

Noises in the deaf ear and a feeling of pressure are also common; among rarer symptoms are nausea and dizziness. The only way to be sure that deafness is due to choking of the air passages with wax is to see the wax. This is usually accomplished by a physician by throwing a good light from a mirror into a small tube introduced into the ear passage. This procedure is of course impossible for a layman, but if the ear is drawn upward, backward, and outward, so as to straighten the canal, it may be possible for anyone to see a mass of yellowish-brown or blackish material filling the passage. And, in any event, if the wax cannot be seen, one is justified in treating the case as if it were present—if sudden deafness has occurred and competent medical aid is unobtainable—since no harm will be done if wax is absent, and, if it is present, the escape of wax will usually give immediate relief from deafness and other symptoms.

**Treatment.**—The wax is to be removed with a syringe and water as warm as can be borne comfortably. A hard-rubber syringe having a piston, and holding as much as possible, is to be employed.

The clothing of the patient should be protected by towels placed around the neck and under the deaf ear. A basin is also held under the ear to catch the water flowing out of the canal. The tip of the syringe is introduced just within the entrance of the ear, which is to be pulled backward and upward, and the stream of water is to be directed with considerable force against the upper and back part of the passage, rather than directly down upon the wax. The water which is first returned is discolored, and then, on repeated syringing, little flakes of dry skin, with perhaps some wax adhering, may be



seen floating on top of the water which flows from the ear, and finally, after a longer or shorter period, a plug of wax becomes dislodged, and the whole trouble is over.

This is the rule, but sometimes the process is very long and tedious, only a little wax coming away at a time; rarely, dizziness and faintness will require the patient to lie down for a while. The water should always be removed from the ear, after syringing, by twisting a wisp of absorbent cotton about the end of a toothpick or match (which has first been dipped in water to make the cotton adhere). The tip of the match, thus being thoroughly protected by dry cotton applied so tightly that there is no danger of it slipping off, is gently pushed into the bottom of the canal and removed (while the ear is pulled backward and upward to straighten the canal). The ear is thus to be wiped out repeatedly with fresh cotton wool until the cotton returns dry. Finally a pledget of cotton should be loosely packed in the ear passage and worn by the patient for twelve to twenty-four hours.

#### PERSISTENT AND CHRONIC DEAFNESS

A consideration of deafness requires some understanding of the structure and relations of the ear with other parts of the body, notably the throat. It has been pointed out that the external ear—comprising the fleshy portion of the ear, or auricle, and the opening, or canal, about an inch long—is separated from that portion of the ear within (or middle ear) by the drum membrane. The middle ear, while protected from the outer air by the drum, is really a part of the upper air passages, and participates in disorders affecting them. It is the important part of the ear as it is the seat of most ear troubles, and disease of the middle ear not only endangers the hearing, but threatens life through proximity to the brain.

In the middle ear we have an air space connected with the throat by the eustachian tube, a tube about an inch long running downward and forward to join the upper air passage at the junction of the back of the nose and upper part of the throat. If one should run the finger along the roof of the mouth and then hook it up behind and above the soft palate one could feel the openings of these



tubes (one for each ear) on either side of the top of the throat or back of the nose, according to the view we take of it.

Then the middle ear is also connected with a cavity in the bone back of the ear (mastoid cavity or cells), and the outer and lower wall is formed by the drum membrane. Vibrations started by sound waves which strike the ear are transmitted by means of a chain of three little bones from the drum through the middle ear to the nervous apparatus in the internal ear. The head of one of these little bones may be seen by an expert, looking into the ear, pressing against the inside of the drum membrane. Stiffening or immovability of the joints between these little bones, from catarrh of the middle ear, is most important in producing permanent deafness. The middle ear space is lined with mucous membrane continuous with that of the throat through the eustachian tube. This serves to drain mucus from the middle ear, and also to equalize the air pressure on the ear drum, so that the pressure within the middle ear shall be the same as that without.

When there is catarrh or inflammation of the throat or nose it is apt to extend up the eustachian tubes and involve the middle ear. In this way the tubes become choked and obstructed with the over-secretion or by swelling. The air in the middle ear then becomes absorbed in part, and a species of vacuum is produced with increased pressure from without on the ear drum. The drum membrane will be pressed in, and through the little bones pressure will be made against the sensitive nervous apparatus, irritating it and giving rise to deafness, dizziness, and the sensation of noises in the ear. Noises from without will also be intensified in passing through the middle ear, when it is converted into a closed cavity through the blocking of the eustachian tube.

A very important feature following obstruction of the eustachian tubes, and rarefaction of the air in the middle ear, is that congestion of the blood vessels and increased secretion ensues, because the usual pressure of the air on the blood vessels within the middle ear is taken away.

**Causes.**—Chronic catarrh of the nose and throat is the cause of most permanent deafness, to which is given the name catarrhal deaf-

ness, because every fresh cold in the head, or sore throat, tends to start up trouble in the ear such as we have just described. Repeated attacks leave vestiges behind until permanent deafness remains.

In normal conditions every act of swallowing opens the apertures of the eustachian tubes in the throat, and allows of equalization of the air pressure within and without the ear drum, but if the nose is stopped by a cold in the head or enlargement of the tissue at the back of the nose (as from adenoids), the process is reversed and air is exhausted from the eustachian tubes with each swallowing motion.

**Prevention.**—The moral to be drawn from all the foregoing is to treat colds properly when they are present, keeping the nose and throat clean and clear of mucus, and to have any abnormal obstruction in the nose or throat and source of chronic catarrh removed, as enlarged tonsils, adenoids, and nasal outgrowths.

#### FOREIGN BODIES IN THE EAR

Foreign bodies, as buttons, pebbles, beans, corn, cherry stones, coffee, seeds, etc., are frequently placed in the ear by children; insects sometimes find their way into the ear passage and create tremendous distress by their struggles. Smooth, non-irritating bodies, as buttons, pebbles, etc., do no particular harm for a long time, and may remain unnoticed for years. But the most serious damage not infrequently results from unskillful attempts at their removal by persons (even physicians unused to instrumental work on the ear) who are driven to immediate and violent action on the false supposition that instant interference is called for.

**Treatment.**—Insects, it is true, should be killed without delay by dropping sweet oil, castor oil, linseed, machine oil, glycerin, or even water, into the ear if the others are not at hand, and then the insect should be removed in half an hour by syringing as recommended for wax in the ear.

To remove solid bodies, turn the ear, containing the body, downward, pull it outward and backward, and rub the skin just in front of the opening into the ear with the other hand, and the object may fall out.

Failing in this, syringing with warm water, as for removal of

wax, while the patient is sitting, may prove successful. The essentials of treatment then consist, first, in keeping cool; then in killing insects by dropping oil or water into the ear, and, if syringing proves ineffective, in using no instrumental methods in an attempt to remove the foreign body, but in awaiting such time as skilled medical services can be obtained. If beans or seeds are not washed out by syringing, the water may cause them to swell and produce pain. To obviate this, drop alcohol—which absorbs water—in the ear and it will thus shrivel the seed.

### EARACHE

Earache is due usually not to neuralgia of the ear, but to a true inflammation of the middle ear, which either subsides or results in the accumulation of inflammatory products until the drum is ruptured and discharge occurs from the external canal. The trouble commonly originates from an extension of catarrhal disease of the nose or throat, the germs which are responsible for these disorders finding their way into the eustachian tubes, and thus into the middle ear. Any source of chronic catarrh of the nose or throat—as enlarged and diseased tonsils, adenoids in children, or nasal obstruction—favors the growth of germs and the occurrence of frequent attacks of acute catarrh or “colds.”

The grippe has been the most fruitful cause of middle-ear inflammation and earache in recent years. Any act which forces up fluid or secretions from the back of the nose into the eustachian tubes (*See* Section on Deafness) and thus into the middle ear, is apt to set up inflammation there, either through the introduction of germs, or owing to the mechanical injury sustained. It follows for this reason that the act of sniffing water into the nose, or blowing the nose violently when there is secretion or fluid in the back of the nose, or the employment of the postnasal syringe are one and all attended with this danger.

Swimming on the back, diving, or surf bathing also endanger the ear, as cold water is forcibly driven not only into the external auditory canal, but, what is more frequently a source of damage, into the eustachian tubes through the medium of the nose or throat.

In this case the plugging of the nose with cotton would be of more



value than the external canal, as is commonly practiced. If water has entered the eustachian tube, blowing the nose and choking merely aggravate the trouble. The wiser plan is to do nothing but trust that the water will drain, and if pain ensues treat it as recommended below for severe earache.

Water in the ears is sometimes removed by jumping about on one foot with the troublesome ear held downward, and if it is in the external canal it may be wiped out gently with cotton on the end of a match, as recommended in the article on treating wax in the ear. In treatment of catarrh in the nose or throat only a spray from an atomizer should be used, as Dobell's or Seiler's solution followed by menthol and camphor, ten grains of each to the ounce of alcoholene or liquid vaselin by means of a medicine dropper.

Exposure to cold and the common eruptive diseases of children—as scarlet fever, measles, and also diphtheria—are common causes of middle-ear inflammation. In the latter disorders the protection afforded by a nightcap which comes down over the ears, and worn constantly during the illness, is frequently sufficient to ward off ear complications.

**Symptoms of Inflammation of the Middle Ear.**—Pain is severe and often excruciating in adults. It may be felt over the temple, side, and back of the head and neck, and even in the lower teeth, as well as in the ear itself. The pain is increased by blowing the nose, sneezing, coughing, and stooping. There is considerable tenderness usually on pressing on the skin in front of the ear passage. Some deafness and noises in the aching ear are usual.

In infants there may be little evidence of pain in the ear. They are apt to be very fretful, refuse food, cry out in sleep, often lie with the affected ear resting on the hand, and show tenderness on pressure immediately in front or behind the ear passage.

Dullness, fever, chills, and convulsions are not uncommon in children, but, on the other hand, after some slight illness it is not infrequent for discharge from the ear to be the first sign which calls the attention of parent or medical attendant to the source of the trouble. For this reason the careful physician will always examine the ear in doubtful cases of children's diseases.



Unless the inflammation subsides with treatment, either a thin, watery fluid (serum) is formed in the middle ear, or pus, in which case we have an "abscess of the ear." The drum, if left to itself, breaks down in three to five days, or much sooner in children who possess a thinner membrane. A discharge then appears in the canal of the external ear, and the pain is relieved. It may occasionally happen that the eustachian tube drains away the discharge, or that the discharge from the drum is so slight that it is not perceived, and recovery ensues. Discharge from the ear continues for a few weeks, and then the hole in the drum closes and the trouble ceases.

This is the history in favorable cases, but unfortunately the opposite state of affairs results not infrequently, especially in neglected patients.

Although earache or middle-ear inflammation is common, its dangers are not fully appreciated, since various complications are likely to arise, and the result is not rarely serious. Extension of the inflammation to the mastoid cells or the bone behind the ear (mastoid abscess) may necessitate chiseling away a part of the skull to liberate pus or dead bone in this locality, and the occurrence of abscess of the brain will necessitate operation.

**Treatment of Severe Earache.**—It is wise for the patient to take a rapidly acting cathartic at the outset, such as a heaping tablespoonful of Epsom salts, for an adult, or one or two grains of calomel for a child. He should go to bed and lie all the time with the painful ear on a bag containing water as hot as can be comfortably borne. Every two hours a jet of hot water, which has been boiled and cooled sufficiently to permit of its use, should be allowed to flow gently from a fountain syringe into the ear for ten minutes and the ear then dried with absorbent cotton, as described under the treatment of wax in the ear.

It may not be possible to carry out such treatment, and in that case one may drop one-quarter of a teaspoonful of a ten per cent. solution of carbolic acid in glycerin (warmed) in the ear, but this treatment is not to be repeated.

The application of leeches in the beginning of the attack is of value and not in any way painful. One should be applied just in

front of the opening of the ear (which should first be closed with absorbent cotton to prevent the entrance of the leech), one just below the ear on the neck, as close to the ear as possible, and a third in the crease behind the ear where it joins the head and at the level of the opening into the ear. A drop of milk at these points will usually start the leeches to work and when they are gorged with blood and cease to suck they should be removed, and bleeding should be encouraged by applying hot compresses of absorbent cotton to these places for half an hour longer. Then clean dry, absorbent cotton should be applied and pressure made with a bandage to stop further bleeding.

The aftertreatment of the bites consists in cleanliness and the use of vaselin. Ten drops of laudanum <sup>1</sup> for an adult, or a teaspoonful of paregoric <sup>1</sup> for a child, may be given by the mouth, to relieve the pain. The patient should stay in bed with the ear on a hot water bag until the pain ceases.

If the pain continues more than twelve hours, it is advisable to consult an aurist who will lance the drum of the ear if an abscess is forming—rather than to wait until it breaks open spontaneously—to avoid complications.

The ear drum is not essential to hearing, but is valuable in keeping out dust, water, germs, etc., which are likely to set up inflammation of the middle ear. The opening in the drums, caused by the escape of “matter,” usually closes, but even if it does not, deafness may not follow. If the contents of an abscess in the middle ear are not allowed to escape as soon as possible there is danger of an abscess in the mastoid cells in the bone of the skull back of the ear—a much more serious disease. Then after the abscess begins to discharge from the ear, if the condition is neglected, a chronic discharge lasting for months or years may ensue. This again threatens the patient in leading to destruction of the bones of the ear, to deafness, mastoid abscess, and various complications.

When the ear begins to run after an earache, the discharge is a sign that fluid has formed and broken through the ear drum. The ear should be wiped dry twice daily with clean absorbent cotton

<sup>1</sup> Laudanum and paregoric can only be obtained with a doctor's prescription.

wrapped on a toothpick. Then it should be wiped in the same way with cotton wet with a solution of hydrogen peroxid, dried with cotton, and some boric acid powder should be dusted in the ear from a salt shaker.

Gentle syringing with a saturated solution of boric acid in a fountain syringe may be used, if there is a great amount of discharge, and the ear may be then dried, as described above, and dusted with pure boric acid. If at any time, with abscess of the ear, pain begins back of the ear, mastoid inflammation may be suspected. This is often seen with sudden cessation of the discharge from the ear.

#### MODERATE OF SLIGHT EARACHE

A slight or moderate earache, which may, however, be very persistent, though not sufficient to incapacitate the patient or prevent sleep, is often caused by some obstruction in the eustachian tube, either by swelling or mucous discharges (in adenoid growths, enlarged tonsils, chronic catarrh, etc.).

This condition gives rise to the train of effects noted in the section on deafness. The air in the middle ear is absorbed to some extent, and therefore the pressure within the ear is less than that outside the drum, so that the latter is pressed inward, with the result that pain, and perhaps noises and deafness ensue, and if the condition is not relieved, inflammation of the middle ear as described above.

**Treatment.**—Treatment should be directed toward cleaning the back of the nose and reducing swelling at the openings of the eustachian tubes in this locality, and inflating the tubes with air. A coarse, warm spray of Seiler's solution should be thrown from an atomizer through the nostrils, with the head tipped backward, until it is felt in the back of the throat; after the water has drained away the process is to be repeated a number of times. This treatment should be pursued twice daily.

One hour after the fluid in the nose is well cleared away the eustachian tubes may be inflated by the patient. To accomplish this the lips should be closed tightly, and the nostrils also, by holding the nose; then an effort must be made to blow the cheeks out until



air is forced into the tubes and is felt entering both ears. This act is attended with danger of carrying fluid up into the tubes and greatly aggravating the condition, unless the water from the spray has had time to drain away.

Blowing the nose, as has been pointed out, is unwise, but the water may be removed to some extent by "clearing the throat." The reduction of swelling at the entrance of the eustachian tube in the back of the nose can be properly treated only by an expert, as some astringent (glycerite of tannin) must be applied on cotton wound on a curved applicator, and the instrument passed above and behind the roof of the mouth into the region back of the nose. The specialist also has improved methods of inflating the eustachian tubes.

Rubbing the parts just in front of the external opening into the ear with the tip of one finger, for a period of a few minutes several times a day, will also favor recovery in this trouble.

#### MASTOID INFLAMMATION

**Causes.**—This may be induced by forcible syringing of the ear in driving germs through the hole in the drum (after ear abscess) back into the middle ear and thus into the mastoid cells, which connect with the middle ear.

However, mastoid inflammation may occur with the best of care and often arises in the first or second week of ear abscess or later in chronic cases.

**Symptoms.**—There is severe pain about the ear, back of the ear and over the whole side of the head, with tenderness on pressure over the bone just behind the external opening in the ear. Fever is usually also present. Local redness and swelling may also occur over the mastoid region.

If the tenderness of the bone behind the ear and pain do not subside within twenty-four hours surgical assistance must be obtained at any cost, as a fatal result may ensue.

**Treatment.**—Rest in bed and the application of heat by the means of hot water over the mastoid region is the best way of treating the patient until the aid of an ear specialist or physician is secured.



An icebag is also frequently used for this purpose and may relieve the pain and inflammation more satisfactorily than dry heat; heat is, however, more commonly to be preferred.

While inflammation of the mastoid often subsides in the course of an ear abscess without operation, still, in case of doubt, operation is advisable because in early cases it is without danger, and because of the great fatality of such complications as abscess of the brain, meningitis, etc., in neglected mastoid abscess.

## CHAPTER XIII

### BURNS AND FROSTBITE

Burns and scalds. Frostbite. Chilblains and mild frostbite. Treatment of general effects of cold.

### BURNS AND SCALDS

A burn is produced by dry heat; a scald by moist heat. The effect and treatment of both are practically identical. Burns are commonly divided into three classes, according to the amount of damage inflicted upon the body.

**First Class.**—There is redness, pain, and some swelling of the skin followed, in a few days, by peeling of the surface layer (epidermis) and recovery. Sunburn and burns caused by slight exposures to gases and vapors are included in this class.

*Treatment.*—The immediate immersion of the part in cold water is followed by relief, or the application of cloths wet with a saturated solution of saleratus or baking powder is useful. Anything which protects the burned skin from the irritating effect of the air is efficacious, and in emergencies any one of the following may be applied: starch, flour, molasses, white paint, or a mixture of white of egg and sweet oil (equal parts). Usually after the first pain has been relieved by bathing with soda and water, or its application on cloths, the employment of a simple ointment, such as cold cream or vaselin, suffices.

**Second Class.**—In this class of cases the inflammation is more severe and the deeper layers of the skin are involved. In addition to the redness and swelling of the skin there are present blisters which appear at once or within a few hours. The general condition is affected according to the size of the burn. If half of the body is reddened, death usually results, and a burn of a third of the body is often fatal.

The shock is so great at times that pain may not be at once intense. Shock is evidenced by general depression, with weakness, apathy, cold feet and hands, and failure of the pulse. If the patient rallies from this condition, then fever and pain become prominent.

If steam has been inhaled, there may be sudden death from swelling of the interior of the throat, or inflammation of the lungs may follow inhalation of smoke and hot air.

**Third Class.**—In this class are included burns of so severe a nature that destruction and death of the tissues follows; not only of the skin but, in the worst cases, of the flesh and bones. It is impossible to tell by the appearance of the skin what the extent of the destruction may be until the dead parts slough away after a week or ten days. The skin is of a uniform white color in some cases, or may be of a yellow, brown, gray, or black hue, and is comparatively insensitive at first.

Pus (“matter”) begins to form around the dead part in a few days, and the dead tissue comes away later, to be followed by a long course of suppuration, pain, excessive granulations (“proud flesh”), and unless skillfully treated, by contraction of the surrounding area, leaving ugly scars and interfering with the appearance and usefulness of the parts. The treatment of such cases after the first care becomes that to be pursued in wounds generally (page 18), and belongs within the domain of the surgeon.

*Treatment of the More Severe Burns.*—If the patient is suffering from shock he should receive some hot alcoholic drink, as hot water and whisky, and be put to bed under warm coverings with hot-water bags or bottles at his feet.

The clothing must be cut away from the burned parts with the greatest care, and only a portion of the body should be uncovered at a time. This should be done in a warm room.

Pain may be subdued by laudanum<sup>1</sup>; fifteen drops may be given to an adult, and the drug may be repeated at hour intervals in doses of ten drops until the suffering has been allayed. Lumps of ice held in the mouth will quench the thirst, and the diet should be liquid—milk, soups, gruels, white of egg, and water. The bowels should be

<sup>1</sup> Can be obtained only with doctor's prescription.

moved daily by rectal injections of soap and warm water. As a matter of local treatment, the surface layer of the skin should be kept intact if possible. Blisters are not to be disturbed unless they are large and tense; if so, their bases may be pricked with a needle to let out the fluid contents.

Carron oil (equal parts of olive oil and lime water) has been the common remedy for burns, and it is an efficient, though very dirty dressing, useful if the skin is generally unbroken. It should be applied on clean soft linen or cotton cloth, which is soaked in the oil, laid over the burned area and covered with a thick layer of cotton batting and a bandage. When the skin is denuded, leaving a raw surface exposed, the burn must be treated on the same plan as wounds, and should be kept as clean and free from germs as possible. An ointment made of equal parts of boric acid and vaselin, spread thickly on a sterile cloth, is a good antiseptic preparation in cases where the skin is broken. Oil silk or gutta percha tissue is preferable to sterile gauze or cloth, as they do not stick to the raw tissues.

It is best not to change the dressing oftener than once in two or three days, unless the discharge or odor is considerable. Fresh dressing is very painful and often harmful.

When the dressing is removed, warm saline solution (one teaspoonful of common salt in one quart of water) is allowed to flow over the burn until all discharge is washed off. Then the raw surface is dusted over with pure boric acid or aristol, and the boric-acid ointment applied as before. The cloth upon which the ointment is spread should be made free from germs by boiling in water, and then drying in an oven and keeping it well wrapped in a clean towel until used.

The same care is requisite as that described under Wounds (page 18) in regard to cleanliness.

Very extensive burns are treated most satisfactorily without any dressings whatever. The pain of removing surgical dressings, and the irritation of the raw surface occasioned thereby, are thus avoided—a tremendous gain, especially in children.

The patient, wholly nude, should be placed in a kind of tent on a clean sheet. Electric lights are often used within the tent to bring



the temperature to more nearly that of the body. The raw surfaces of the burns should be protected by frequent dusting with pure powdered boric acid.

The open air treatment of burns is said to have been adopted from the American Indians and, in the case of children particularly, one avoids the piteous and heartrending cries and pain attending the older methods of dressing burns, and at the same time it is most favorable to healing.

It is beyond the scope of this work to describe the various complications and the details of the after-treatment in severe burns—including skin grafting—which may tax the ingenuity of the skilled surgeon. It is hoped that the foregoing may give a clear idea of the treatment to be pursued in emergencies and may prove of some use to those who may unfortunately be compelled to care for burns during a considerable time without the aid of a physician.

**Burns Caused by Strong Mineral Acids or by Alkalis.**—If acids are the cause, the skin should not be washed at first, but either chalk, whiting, or some mild alkali, such as baking soda, should be strewn over the burn. After the effect of the acid is neutralized, the soda should be washed off with a stream of warm water. Dry gently with gauze. Apply Carron oil or paste of boric acid and vaselin, equal parts. If strong alkalis have been spilled on the skin, as ammonia, potash, or quicklime, then vinegar is the proper substance to employ, followed by washing and gentle drying. Vaseline or cold cream is usually sufficient as after-treatment. Lime water is useful in counteracting the effect of acids spattered in the eye. In the case of alkalis in the eye, the vinegar used should be diluted with three parts of water. Albolene or liquid vaselin is the best agent to drop in the eye after an accident, in order to relieve the irritation and pain; in addition, the patient should stay in a dark room.

## FROSTBITE

The nose, chin, ears, fingers, and toes are the parts usually frozen, although severe results ending in death of the frozen part

are more often due to the low vitality of the patient than to the cold itself. In the milder degree of frostbite there is stiffness, numbness, and tingling of the frozen member; the skin is of a pale, bluish hue and somewhat shrunken. Recovery ensues with burning pain, tingling, redness, swelling and peeling of the epidermis, as after slight burns. The skin is icy cold, white, and insensitive in severe forms of frostbite and, if not skillfully treated, later becomes either swollen and discolored or shriveled, dry and black.

In either case the frozen part dies and is separated from the living tissue after the establishment of a sharp line of inflammation which results in ulceration and formation of pus, and thus the dead parts slough off. It is, however, possible for a part thoroughly frozen to regain its vitality.

*Treatment.*—The essential element in the treatment is to secure a very gradual return of blood to the frozen tissues, and so avoid violent inflammation. To obtain this result the patient should be cared for in a cold room, the frozen parts rubbed gently with snow, or cloth wet with ice water, until they resume their usual warmth. Then it is well to rub them with a mixture of alcohol and water (equal parts) for a time and expose them to the usual temperature of a dwelling room. Warm drinks should not be administered to the patient.

The frozen member, if hand or foot, should be raised high in the air on pillows and covered well with absorbent cotton and bandage. If much redness, swelling, and pain result this dressing should be removed and the part wrapped in a single thickness of cotton cloth kept continually wet with alcohol and water.

Subsequent treatment consists in keeping the damaged parts covered with vaselin or cold cream, absorbent cotton, and bandage. If blisters and sores result, the care is similar to that described for like conditions, under Burns. If death of the frozen part becomes inevitable, the hand or foot should be suspended in a nearly vertical position to keep the blood out, and the part bathed twice daily with a solution of corrosive sublimate (one 7.7 grain tablet to one pint of water), dusted well with aristol, and dressed with absorbent cotton and bandage until the dead tissue separates and comes away. If the

frozen part is large it may be necessary to remove it with a knife; but this is not essential when the tips of the fingers or toes are frozen.

### CHILBLAINS AND MILD FROSTBITE

The effects of severe cold on the body are very similar to those of intense heat, though they are very much slower in making their appearance. After a person has a frozen finger or toe he may not notice much inconvenience for days, when suddenly violent inflammation may set in. The fingers, ears, nose, and toes are the members which suffer most frequently from the effects of cold. Similar symptoms of inflammation, described under Burns, also result from cold—that is, redness and swelling of the skin, blisters with more severe and deeper inflammatory involvement, or, in case the parts are thoroughly frozen, local death and destruction of tissues.

But it is not essential that the body be exposed to the freezing temperature or be frozen at all, in order that some harm may result, for chilblains often follow when the temperature has not been lower than 40° F. or thereabouts.

The effect of cold is to contract the blood vessels, with the production of numbness, pallor, and tingling of the skin. When the cold no longer acts, the blood vessels dilate to more than their usual and normal state, and more or less inflammation results. The more sudden the return to warmth the greater the inflammatory sequel.

Chilblains represent the mildest morbid effect of cold on the body. They exist as bluish-red swellings of the skin, usually on the feet or hands, but may attack the nose or ears, and are attended by burning, itching, and smarting. This condition is caused by dilatation of the vessels following exposure to cold. It is more apt to happen in young, anemic women. Chilblains usually disappear during warm weather. Scratching, friction, or the severity of the attack may lead to the appearance of blisters and sores. In severe cases the fingers and toes present a sausage-like appearance, owing to swelling.

*Treatment.*—Susceptible persons should wear thick, warm (not



rough) stockings and warm gloves. The chilled members must never be suddenly warmed. Regular exercise and cold shower baths are good to strengthen the circulation, but the feet and hands must be washed in warm water only, and thoroughly dried.

If sweating of these parts is a common occurrence, starch or zinc oxid should be dusted on freely night and morning. Cod-liver oil is an efficacious remedy in these cases—one teaspoonful of Peter Möller's pure oil three times daily after meals. The affected parts should be bathed twice daily in a solution of zinc acetate (one drachm to one pint of water), and followed by the application, on soft linen or cotton, of zinc-oxid ointment containing two per cent. of carbolic acid. If this is not curative, iodine ointment mixed with an equal quantity of lard may be tried. Exposure to cold will immediately bring on a recurrence of the trouble. If the affection of the feet is severe the patient must rest in bed. If the parts become blistered and open sores appear, then the same treatment as for burns is indicated. Wash with a weak solution of corrosive sublimate (one  $7\frac{1}{2}$  grain tablet for surgical purposes in two quarts of warm water) and apply an ointment of boric acid and vaselin, equal parts, spread on soft, clean cotton or linen. Rest of the part and existence in a warm atmosphere will complete the cure.

### TREATMENT OF GENERAL EFFECTS OF COLD

Sudden exposure to severe cold causes sleep, stupor, and death. Persons found apparently frozen to death should be brought into a cold room, which should be gradually heated, and the body rubbed with snow or ice water, and artificial respiration employed (*See* page 42).

Attempts at resuscitation ought to be persistent, as recoveries have been reported after several hours of unconsciousness and apparent death from freezing.



## CHAPTER XIV

### THE MEDICINE CHEST

#### NECESSARY DRUGS AND DOSES OF DRUGS FOR ADULTS AND CHILDREN

Besides the necessary drugs, the medicine chest or closet should contain measuring glasses. It should also be arranged for dispensing medicines quickly and conveniently.

The two most important articles are: a glass graduate measuring up to two ounces, and a minim graduate, measuring drops. The latter is useful in the case of powerful medicines. Drops vary in size according to the utensil from which the fluid is dropped, or the character of the liquid. All medicine in fluid form should be measured in a drop or minim graduate.

Dry tablets are the easiest form of medicine to dispense; many drugs, however, are inert when dried and compressed—such, for instance, as many of the tinctures.

A teaspoon of the old style holds approximately one drachm, or sixty minims (modern teaspoons often hold a quarter of a drachm more) and a tablespoonful about one-half an ounce. A sherry wine-glass holds about two ounces, and a glass tumbler holds about one-half a pint.

The chest should contain a small pair of scales with brass weights, measuring from one-half a grain to two drachms.

The medicine chest should not be kept locked; valuable time might be lost in searching for the key, when prompt aid is necessary. It should, however, be kept out of the reach of children.

The following drugs, etc., should be included in the contents:

Aconite, tincture of	Limewater-
Alcohol (for external use)	Magnesia citrate
Aromatic spirit of ammonia	Magnesia sulphate (Epsom salt)
Aromatic fluid extract cascara sagrada	Morphin tablets ( $\frac{1}{4}$ grain) <sup>1</sup>
Aspirin, 10 grain tablets	Mustard leaves
Boracic (or boric) acid	Niter, sweet spirit of
Bromid of sodium	Phenacetin tablets
Blaud's pills of iron	Paregoric <sup>1</sup>
Bismuth subnitrate	Quinin capsules (3 grains)
Calomel tablets, $\frac{1}{4}$ grain	Soda, bicarbonate of
Castor oil	Vaselin
Chalk mixture	Veronal tablets (5 grains)
Chloroform liniment	Whisky
Cholera mixture	Atomizer
Compound cathartic pills	Catheters (soft rubber)
Corrosive sublimate tablets	Clinical thermometer
Dobell's solution	Corks; rubber stoppers
Dover's powder	Corkscrew
Elixir of heroin and terpin hydrate	Cup
Ether	Fountain syringe
Glycerin	Labels
Iodin, tincture of	Spoons
Ipecac, syrup of	Stomach tube

The poisons in this list should be kept in rough, blue bottles, labeled "poison," and include the tincture of aconite and iodine, chloroform liniment, morphine, and corrosive sublimate tablets. Where there are children about it is safer to keep these drugs under lock and key. The morphine tablets are not necessary unless one is far away from medical aid.

The doses given in the following table are for adults. Fractional doses, suitable for those under adult age, are as follows:

For 16 years.....	$\frac{3}{4}$	the adult dose
For 12 years.....	$\frac{1}{2}$	" " "
For 8 to 10 years.....	$\frac{2}{5}$	" " "
For 6 years.....	$\frac{1}{3}$	" " "
For 3 years.....	$\frac{1}{5}$	" " "
For 2 years.....	$\frac{1}{7}$	" " "

<sup>1</sup>Morphine and paregoric can be obtained only on a doctor's prescription.

For 1 year.....	1/10	the adult dose
For 9 months .....	1/15	“ “ “
For 6 months .....	1/20	“ “ “
From birth to 3 months.....	1/30	“ “ “

In the following table, the drugs which are marked with a star are powerful, and may cause poisoning if given in a large dose or if repeated frequently, or oftener than once in a few hours. Many of these drugs may be bought in tablet form.

A minim is a measured drop. A drachm consists of 60 grains or 60 minims.

#### DOSES FOR ADULTS

Arsenic *	1/30 grain
Arsenic, Fowler's solution of *	3 minims
Aconite, tincture of *	10 minims
Alum, as emetic.....	30 to 60 grains
Ammonia, aromatic spirit of.....	1/2 to 1 teaspoonful
Ammonia, solution of acetate of.....	1 teaspoonful
Ammonium chlorid.....	4 grains
Amyl nitrite, by inhalation.....	5 minims
Apomorphin (emetic) *	1/10 grain
Aspirin.....	10 grains
Atropin sulphate *	1/100 grain
Belladonna, solid extract of *	1/4 grain
Belladonna, tincture of *	5 to 8 minims
Bismuth subcarbonate .....	20 grains
Bismuth subnitrate.....	20 grains
Boric acid .....	5 to 10 grains
Bromoform *	5 to 10 minims
Calomel .....	1/8 grain, repeated doses; 3 to 5 grains as a single dose
Camphor .....	2 grains
Camphor, spirit of.....	15 minims
Capsicum (red pepper).....	1 grain
Capsicum, tincture of.....	3 minims
Cascara sagrada, fluid extract of.....	15 to 30 minims
Castor oil.....	Adult, 3 to 4 tablespoonfuls; child, 1 to 2 teaspoonfuls
Cerium oxalate.....	3 grains

Chalk, prepared.....	15 to 30 grains
Chalk, mixture.....	1 to 2 ounces
Chloral * .....	10 to 15 grains
Chloroform * .....	5 minims
Chloroform, spirit of.....	½ to 1 drachm
Cinchona, compound tincture of.....	1 drachm
Codein * .....	½ grain
Colchicum, tincture of *.....	30 minims
Colchicum, wine of *.....	30 minims
Digitalis, tincture of *.....	15 minims
Dover's powder (opium and ipecac) *.....	10 grains
Ergot, fluid extract of.....	1 drachm
Ether * .....	15 minims
Ether, nitrous, spirit of.....	½ drachm
Gentian, tincture of.....	1 drachm
Ginger, fluid extract of.....	10 to 30 minims
Hamamelis fluidextract (witch-hazel).....	1 drachm
Hyoscin hydrobromate *.....	1/100 grain
Hypophosphites, compound, syrup of.....	1 drachm
Ipecac, syrup of.....	½ to 1 drachm
Ipecac, wine of.....	½ to 1 drachm
Ipecac, wine or syrup, as emetic.....	3 to 6 drachms (adult)
Ipecac, powdered, as emetic.....	30 grains
Iron (Blaud's pills), subcarbonate of.....	5 grains
Iron, syrup of iodid of.....	15 minims
Iron and quinin citrate.....	10 grains
<sup>1</sup> Laudanum ( <i>See</i> opium, tincture of).....	8 minims
Limewater .....	4 drachms
Lithium citrate.....	5 grains
Magnesia .....	15 grains
Magnesium citrate, solution of.....	6 ounces (1 glass)
Magnesium sulphate (Epsom salt).....	4 drachms
Male fern,* oleoresin of.....	½ drachm
Malt, extract of.....	1 to 2 drachms
Mercury, blue pills.....	3 to 10 grains
<sup>1</sup> Morphin * and its salts.....	1/8 to 1/3 grain
Nux vomica,* tincture of.....	10 minims
<sup>1</sup> Opium,* extract of.....	1/8 to 1/3 grain
<sup>1</sup> Opium, tincture of (laudanum).....	8 minims
<sup>1</sup> Opium, camphorated tincture of (paregoric).....	1 to 4 drachms
Pancreatin .....	10 grains

<sup>1</sup> Caution. Dangerous. Use only on physician's prescription.



<sup>1</sup> Paregoric *	1 to 4 drachms
Peppermint, oil of.....	2 to 5 minims
Peppermint, essence or spirit of.....	½ to 1 drachm
Pepsin and saccharated pepsin.....	15 grains to 1 drachm
Phenacetin *	7½ grains
Potassium, bromid of.....	10 to 30 grains
Potassium, citrate of.....	15 to 60 grains
Potassium, iodid of.....	5 to 10 grains
Quinin sulphate or tannate.....	2 to 20 grains
Rhubarb, aromatic syrup of.....	1 to 4 drachms
Rhubarb, tincture of.....	½ to 1 drachm
Salol and salophen.....	5 to 10 grains
Salts, Epsom.....	1 even tablespoonful
Salts, Rochelle.....	1 heaped teaspoonful
Salts, Glauber's.....	1 even tablespoonful
Santonin *	1 grain
Senna, syrup of.....	1 to 4 drachms
Silver, nitrate of.....	¼ to ½ grain
Sodium bicarbonate (baking soda).....	10 to 30 grains
Sodium, bromid of.....	10 to 30 grains
Sodium, salicylate of.....	10 to 20 grains
Sodium sulphate, Glauber's salts.....	4 drachms
Squill, compound syrup of.....	10 to 30 minims
Squill, syrup of.....	½ to 1 drachm
Sulphur .....	1 drachm
Sweet spirit of niter.....	½ drachm
Turpentine, oil of.....	15 minims
Valerian, ammoniated tincture of.....	½ to 2 drachms
Zinc sulphate (emetic).....	10 to 30 grains

## DOSES OF DRUGS FOR BABIES ONE YEAR OLD

(In the table the drugs which are marked with a star are powerful and dangerous in large or in repeated doses.)

Aconite,* tincture of.....	1/3 to 1/2 minim
Belladonna,* tincture of.....	½ to 1 minim
Bismuth, subnitrate of.....	5 grains
Brandy .....	5 to 20 drops
Bromid of potassium or sodium.....	½ to 4 grains
Calomel 1/10 grain.....	Every 30 minutes or ½ grain in single dose

<sup>1</sup> Caution: Dangerous. Use only on physician's prescription.

Castor oil.....	1 drachm
Chloral * .....	½ to 1 grain
Citrate of potash.....	1 to 2 grains
Cod-liver oil.....	¼ to ½ drachm
<sup>1</sup> Dover's powder .....	⅛ to ½ grain
Gin .....	10 to 15 drops
Ipecac, syrup or wine of.....	1 to 2 minims
Magnesia .....	5 to 20 grains
Magnesia, citrate, solution of.....	6 to 8 drachms
Niter, sweet spirit of.....	2 to 4 minims
<sup>1</sup> Paregoric .....	3 to 10 minims
Peppermint water .....	½ to 1 drachm
Rhubarb, spiced syrup of.....	1 drachm
Senna, syrup of.....	10 to 15 minims
Soda bicarbonate .....	1 to 2 grains
Squill, compound syrup of ("hive syrup")....	1 to 2 minims
Squill, syrup of .....	2 to 5 minims
Whisky .....	5 to 20 minims
Wine, sherry and port.....	½ teaspoonful

TABLE SHOWING DOSES FOR CHILDREN AT SPECIFIED AGES

	6 months	18 months	3 years	5 years
Aspirin .....	1	1-2	2-3	3-5 grains
Belladonna, tincture ½	1	1-2	3-5 drops	
Bismuth .....	10	10	10	20 grains
Brandy .....	5-10	10-20	20-30	30-40 drops
Bromid, sodium or potassium .....	2	3	4	6 grains
Calomel .....	1/10	1/6		grain every 30 min. <sup>1</sup>
Calomel .....			¼	¼ grain every hour
Camphor, spirit of. 3	5	5-10	10 drops	
Cascara sagrada, aromatic fluidextract of .....	15	30	30	60 drops
Castor oil.....	1	2	3	4 teaspoonfuls
Chloral .....	2	3	5	10 grains by the rectum
Ipecac syrup or wine .....	1	1-2	3	3-5 drops
<sup>1</sup> Paregoric.....	3-5	10	15-20	20-30 drops

<sup>1</sup> Can be obtained only with doctor's prescription.

<sup>2</sup> It will rarely be necessary to give more than a grain of calomel including all the doses given.

Quinin sulphate...	1/2	1-2	2-3	3-4 grains
Quinin tannate in chocolate tablets.	1	2-4	4-6	6-8 grains (Best form for children)
Whisky .....	5-10	10-20	20-30	30-40 drops

## FIRST AID SURGICAL OUTFIT

A first aid surgical outfit is desirable for use in mills, logging camps, military camps, mines, vessels, wherever numbers of persons are employed, and for those living in remote places. The following outfit includes the essentials. The quantity of materials may be altered to suit the circumstances:

- 1 dozen sterile gauze bandages, 2½ inches wide.
- 1 roll of zinc oxid plaster, 3 inches wide, 10 yards long. May be torn any width.
- 1 dozen packages each containing 1 yard of sterile gauze.
- 1 pound of absorbent cotton.
- 2 packages each containing 1 square of oil silk about 1 foot square.
- 1 pair of straight surgical scissors with blunt points (Mayo).
- 1 pair of dissecting forceps.
- 1 pair of small needle forceps.
- 6 glass tubes, each containing needles threaded with surgical silk (sterile).
- 6 glass tubes each containing No. 1 iodized catgut sutures sterilized.
- 2 enamel hand basins.
- 1 hand scrub brush.
- 6 curved medium-sized surgical needles with cutting edge.
- 4 ounces of tincture of iodine.
- 1 bottle of large size tablets of corrosive sublimate.
- 4 collapsible metal tubes of borated vaselin.

Boric acid in tin,  $\frac{1}{2}$  pound.

Collodion, 2 ounces.

1 glass syringe holding 2 ounces.

2 ounces of compound tincture of benzoin.

1 quart of denatured alcohol.

8 ounces of compound cresol solution.

8 ounces of hydrogen dioxid.

2 ounces of Peruvian balsam.

6 ounces of whisky.

1 tourniquet.

These should be kept in a suitable cupboard or chest. When only a small outfit is required the iodine, gauze and bandages should be selected and the rest rejected. The corrosive sublimate tablets and Peruvian balsam are most useful for daily dressing of wounds. The instruments most essential are scissors and forceps.

All the rest of the outfit may be dispensed with when only a small outfit can be used, on account of weight or expense.



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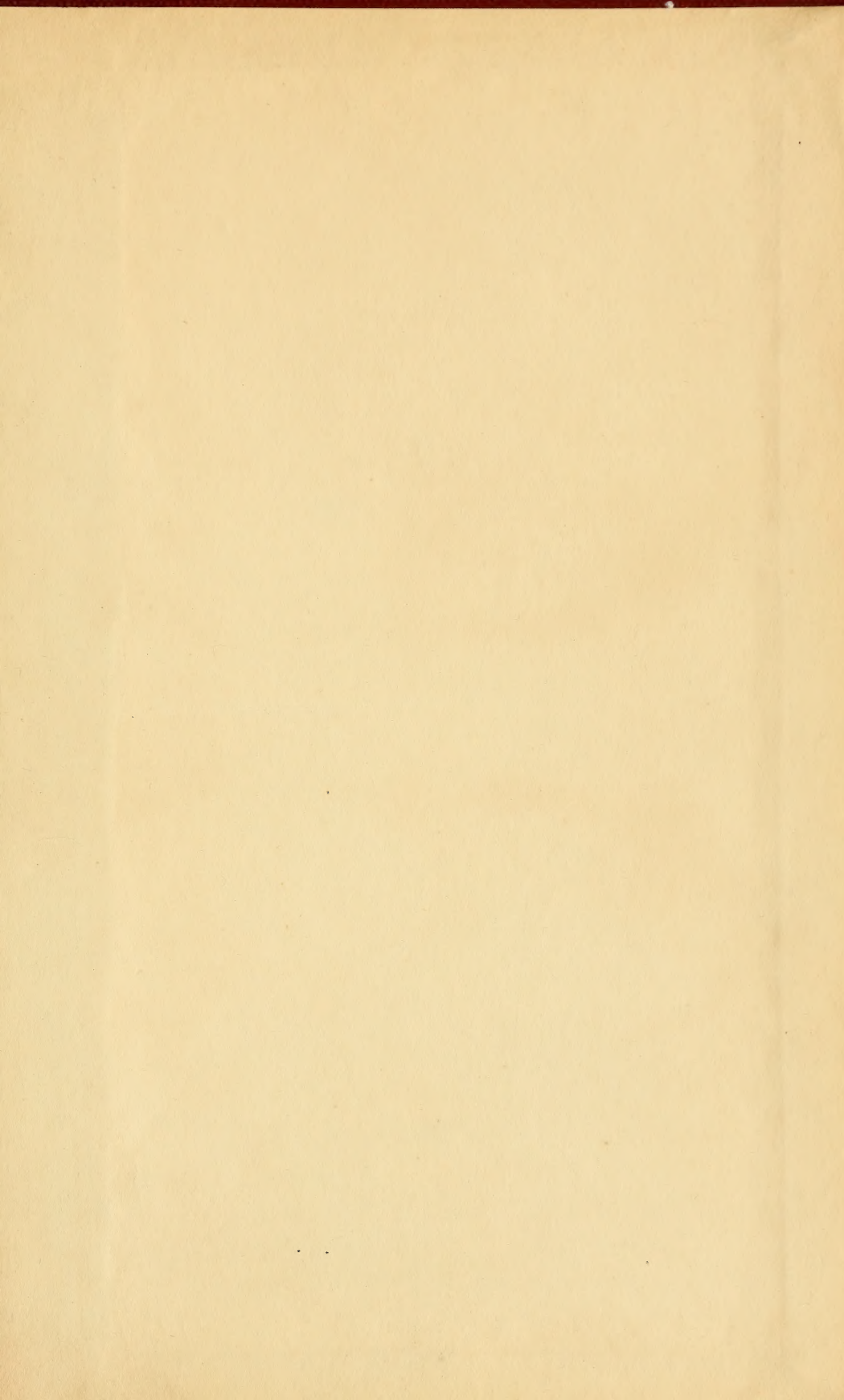














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